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A CRITICAL INQUIRY INTO THE ÆTIOLOGY OF CHRONIC PEPTIC ULCER.[1]

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Introduction.

IT is one of the sad commentaries on the progress of gastroenterology that the pathogenesis of peptic ulcer has not yet been definitely established. The amount of research work undertaken to elucidate this problem has been enormous; but, unfortunately, many of the artificial conditions established in experimental work are foreign to human existence, and because of this some at least of the conclusions are not applicable to the human subject. The first theory was advanced in 1853 by Virchow, and has been popularized as the circulatory theory. The neurogenic theory was originally proposed by von Bergmann and has been amplified as the spasmogenic or vagotonic theory by Eppinger and Hess. About thirty years ago the pathogenesis of gastric and duodenal ulcer began to be attributed primarily to a superabundance of gastric acid; hence the enthusiasm for extensive gastrectomy by the German school, in the belief that the removal of a large part of the stomach would eliminate this acid factor. In point of fact, a Victorian surgeon has recently claimed that such an operation removes the whole of the "acid-secreting" area of the stomach—a pernicious and erroneous doctrine. Finally, about ten years ago, the inflammatory theory was proposed. This was stressed by

[1] Read at a clinical meeting of the staff of the New South Wales Community Hospital on October 21, 1937.

Konjetzny and was emphasized by the French school.

The most important and almost the only uncontradicted factor with regard to peptic ulcer is the anatomical and physiological location. These quite typical ulcers occur only in that portion of the gastro-intestinal tract which may be exposed to the action of hydrochloric acid.

Although the distinctions between them are not very clear-cut, it has been customary to recognize three types of peptic ulcer: acute, subacute and chronic, according to the length of time that it has been in existence. The acute phase lasts for about two or three weeks and, except for the rare acute penetrating ulcer, the ulcerative process involves the mucosa and submucosa only. In the subacute phase ulceration invades the *muscularis mucosæ*. The ulcer is said to be chronic in about six or seven weeks, by which time there is considerable destruction of the outer coats of the viscus.

The distribution of chronic ulcer is fairly characteristic; it is almost invariably solitary and is nearly always found along the line of the lesser curvature, within four inches of the pylorus. Subacute ulcers, however, are more irregular in their distribution; they are often single, though as many as half a dozen may occur at the same time. The great majority are situated also along the lesser curvature. Although multiple acute ulcers or erosions are scattered, in considerable numbers, widely and irregularly over the interior of the stomach, two mains groups, the fundal and the pyloric, or pathway erosions may be recognized. This distinction extends further than a mere anatomical location; for whilst the former originates as a hæmorrhage in the mucosa, the latter usually commences as a greyish circumscribed membrane covering a saucer-like denudation of the surface of the mucosa. It is from the latter group that chronic ulcers are believed to originate.

The chronic erosive gastritis on which Konjetzny, Puhl, Orator and others have laid so much stress in the ætiology of peptic ulcer, appears to be nothing more or less than the pyloric or pathway erosions of English authors.

The microscopic structure of a chronic peptic ulcer is characteristically uninteresting. The surface of the ulcer is composed of granulation tissue, the innermost part of which is necrotic and covered by a moderate inflammatory exudate. Beneath this there is a zone of fibrous tissue, which extends, in chronic lesions, to the outer coat of the viscus and entirely replaces the muscle coats. In healing or progressive lesions the microscopic appearance suggests a certain degree of activity; but the more indolent ulcers appear to be quiescent, and it is notable that, except in the superficial zone, there are none of the cellular or vascular reactions which are usually associated with the presence of bacteria; there is in fact no evidence that the lesions represent an infective process.

One very common feature of chronic ulcer is of some importance, namely, the pronounced endarteritis present in the arteries situated in its floor. This should be regarded as a secondary and not a primary reaction, and in no way related to the ætiology of the lesion.

The problem of the causation of these ulcers remains obscure, and a bewildering array of quite unrelated causes, including trauma, infection, interference with blood supply, stimulation of the interbrain, vitamin (B_1 or F) deficiency, disturbance of endocrine function *et cetera*, have been brought forward as possible ætiological factors. But in so far as these hypotheses are based on experimental evidence, their weakness lies in the fact that the ulcer produced has almost invariably been of an acute, superficial and rapidly healing type. Not only has the cause of the local lesion to be determined, but the reasons for its progress and its chronicity have to be discovered.

Trauma.

One of the important functions of the stomach is the protection of the small intestine from mechanical, thermal and chemical irritation. The present-day practice of bolting incompletely masticated food and zealously imbibing spirits and cocktails whilst fasting, must necessarily subject the mucous membrane of this viscus to repeated mechanical and chemical injury. Similarly, the ingestion of an excess of indigestible raw vegetable matter in the mistaken idea that plenty of roughage is good for health will have an identical effect.

Although the medical profession in general is fully cognizant of the consistent manner in which recent chronic peptic ulcers may be induced to heal through the adoption of an efficient medical régime, it has apparently overlooked the fact that such ulceration will just as readily recur when its possessor returns to his pre-ulcer habits as regards eating, drinking, smoking *et cetera*.

C. Keith Simpson has shown that the association of gastritis with hyperacidity, each of subminimal intensity, may bring about erosion or the formation of acute ulcers.

In the near future investigations into the ætiology of chronic peptic ulcer in calves may shed some light on their development in man. These ulcers do not occur whilst the calves are being suckled, but only when they are taken away from their mothers and begin to be fed on a partially or exclusively vegetarian diet. Tantz examined the abomasa of 1,500 calves and found ulcers in the percentages shown in Table I.

TABLE I.

Percentages of Calves Affected with Ulcer of the Abomasum at Different Ages (Tantz).

Age of Calf.	Percentage Affected.
4 weeks	0
4 to 5 weeks	78·4
8 weeks	94·8
10 to 12 weeks	95·6
12 to 14 weeks	98·0
12 months	68·7

Ulcer also occurs in adult cattle.

Max Henry, chief veterinary surgeon of the Department of Agriculture of New South Wales, suggests that, owing to the sudden change in diet, the resultant mechanical irritation, combined with an insufficiently developed rumen, induces trauma of the mucous membrane, with the result that acute ulcers form. The spasmodic contraction of the abomasum immediately proximal to the pylorus must play an important part in their transformation into chronic ulcers, because the mucous membrane at the site of this obstruction is subjected to the constant irritation of the moving feed, which is being forced through.

Excluding trauma, which will be variable and will have almost an individual application, I shall now discuss the three classical theories for the causation of an acute ulcer: infection; ischæmic necrosis due to vascular lesions, rupture, thrombosis or spasm; and the influence of a chemical factor.

Infection.

There is abundant evidence that multiple acute gastric ulcers may be associated with severe infective conditions, especially those involving the peritoneum, and histologically these lesions are clearly septic. A. J. Walton investigated twenty-four fatal cases in which hæmorrhage had occurred from an acute ulcer subsequent to operation, and he found acute appendicitis in thirteen. The reflex epigastric pain and vomiting caused by appendicitis, when associated with the hæmatemesis caused by the ulcer, formed a group of symptoms whch led to the surgeons' aphorism that the physicians' acute gastric ulcer lay in the right iliac fossa.

The relationship between chronic appendicitis and chronic peptic ulcer is far from conclusive; for when we come down to hard facts we read that the late Lord Moynihan found appendicitis associated with 66% of cases of duodenal ulcer, whilst A. J. Walton shows this association to occur in only 4% of cases. In 100 consecutive cases of duodenal ulcer in my private and hospital practice the appendix had been removed, prior to examination, in 23, an unduly high proportion. Seale Harris states that 50% of the patients consulting him for peptic ulcer had already had appendicectomy performed through a small incision in the right lower quadrant of the abdomen.

Other conditions which are sometimes, though less frequently, associated with multiple acute ulcers, are suppurative cholecystitis, ulcerative colitis, pyosalpingitis, suppurative pansinusitis, empyema, bronchiectasis, chronic phthisis with infected cavities, abscess of the lung *et cetera*.

But why should the process persist in one focus out of many, and thus give rise to a single chronic ulcer?

Acute ulcers may be produced experimentally with relative ease, and the methods employed to produce them are numerous. Bolton, Butsch, Durante, Greggio and Ivy have supplied an exhaustive bibliography. It should be noted that these experimentally produced ulcers occur only in that portion of the gastro-intestinal tract which may be exposed to the action of hydrochloric acid. Again, such ulcers heal with the greatest readiness, usually in three or four weeks; in fact the difficulty has been to prevent them from healing.

Furthermore, at autopsy in acute infections and intoxications, acute multiple ulcers in all stages of healing are frequently encountered in those patients who have survived for a few weeks.

E. C. Rosenow, of the Mayo Clinic, has isolated a non-hæmolytic streptococcus from gastric and duodenal ulcers and from infected teeth and tonsils of patients suffering from ulcers, and has inoculated (intravenously) these into laboratory animals with the production of acute peptic ulcers in a high proportion of experiments, and the point is made that these organisms act specifically and settle in the stomach in preference to other parts of the body. Upon immunization of animals with the specific streptococcus, but not with streptococci obtainable from other sources, the liability to the formation of ulcers was greatly reduced—from 82% to 17%. Furthermore, although ulcer-specific streptococci are recoverable from septic foci in the tonsils and teeth, it is maintained that like organisms, isolated from identical foci in patients not suffering from peptic ulcer, are far less likely to initiate experimental ulcers than the non-hæmolytic strain recoverable from those foci in patients with peptic ulcers. The above observations have been confirmed by Haden and Bohan and by Christophe and Nakamura.

Briefly, a strain of streptococcus is evolved in remote foci whose natural habitat is the gastro-duodenal mucosa. The only other possible explanation of such a phenomenon is that non-ulcer-specific streptococci derived from chronic foci are transported to various parts of the body. Some of the cocci settle in the mucous membrane of the stomach and, finding it a particularly favourable site, develop a special affinity for that particular organ. In some mysterious manner some of these gastric cocci are again liberated into the blood stream, and by that means eventually reach the chronic foci from which they were originally derived. Here they again come to rest, although always retaining an urge to return to the tissue of their adoption, a characteristic which they transmit to their progeny.

Such experiments have been declared to furnish a strong support to the theory that there is a close relationship between peptic ulcer and septic foci, more especially those located in the tonsils, nasal sinuses and apices of the teeth. It is quite logical to assume that such foci may be a source of an intermittent bacteriæmia, and that microorganisms may be transported by the blood stream to, amongst other places, the gastro-duodenal mucosa; but there is absolutely no proof that such an invasion will produce more than a temporary lesion.

As stated previously, the microscopic study of sections of a chronic peptic ulcer does not reveal

any evidence of an infective process, and in the absence of any response of the tissues to its presence, the mere isolation of an organism from the lesion cannot carry any ætiological significance. The clinical evidence of the association of septic foci and chronic peptic ulcer is equally inconclusive.

Further, would it not be more logical to assume that if a certain streptococcus is constantly present in ulcerated stomachs, it is there only because it is a type possessing greater resistance to hydrochloric acid than others amongst the numerous mouth streptococci normally swallowed in hundreds of millions every hour? Such a streptococcus might multiply in the base of a preformed ulcer and might even give rise to agglutinin formation; but that is not to say that it produced the ulcer.

When we read in "Gastric and Duodenal Ulcer", by Hurst and Stewart (page 47), that a woman owed her ulcer to a streptococcal vaccine administered for rheumatoid arthritis, we can only be thankful that the fashion for vaccine therapy is on the wane; for the clientele of the various rheumatic clinics appear to have lived far more dangerously than they realized.

As far as the infective theory is concerned, we may accept a bacterial origin for a certain proportion of acute ulcers; but, with regard to chronic ulcer, all the evidence is against the view that it originates from the persistent action of micro-organisms.

The Vascular Theory of Causation.

The minute multiple hæmorrhagic erosions involving the gastric mucosa which are frequently found at autopsy when vomiting has preceded death, are clearly of vascular origin and appear to be explicable on the assumption that gastric contractions cause a constriction of the arteries and veins as they pass through the musculature. Although these lesions occur mainly in the *pars media* or body, larger and deeper isolated erosions are occasionally met with along the gastric pathway, the common site of peptic ulceration. All vascular erosions, however, are not necessarily due to obliteration of the blood supply by external agencies.

The majority of chronic ulcers occur at an age when severe vascular disease may be disregarded, and, although a pronounced endarteritis is commonly found in the vessels of the ulcer's base, this lesion must be regarded as a secondary phenomenon. Embolism has been suggested; but there is no proof that it plays any prominent part in the process.

Another possibility is the occurrence of spasm of the gastric vessels, without the presence of any recognized anatomical lesion. Direct examination with the capillary microscope of the vascular bed in the skin and mucous membranes of persons with a "vaso-neurotic diathesis" has shown, instead of the normal regularity, the greatest irregularity in the course, calibre and anastomoses of the arterioles, capillaries and venules. Muller and Hamberger, of Tübingen, examined warm fresh specimens immediately after partial gastrectomy performed on patients with peptic ulcer, and found that a similar spastic-atonic condition was constantly present in the minute vessels of the gastric mucosa.

If we accept that such a state of affairs obtains, it may well account for the occurrence of erosions. But it would be extremely difficult to explain peptic ulcer on such lines; for there is no evidence that such vascular spasms are more than transient.

Stimulation of the Interbrain.

Recent experiments on animals have proved that in the anterior part of the hypothalamus, round about the optic chiasma, are situated the parasympathetic centres, whilst further back, in the region of the mammillary bodies, are situated those for the sympathetic system. Stimulation of the parasympathetic centres has produced increased gastric motility, gastric secretion, and redness of the gastric mucosa. Release of these centres from cortical control and inhibition, which may be achieved by bilateral incision into the frontal lobes at or just in front of the optic chiasma (Fulton), amongst other things produces identical phenomena. A certain number of animals (dogs) operated on in this way became affected with acute gastric ulcers, some of which went on to perforation.

More recently, A. D. Keller has shown that vagotomy protects the gastric mucosa from the above-mentioned changes.

It has long been known that certain types of organic brain disease, such as tumour, Parkinson's disease and disseminated sclerosis, often induce extreme gastric spasm, with or without pain.

May I point out that this parasympathetic centre in the diencephalon has ties in three directions: with the cortex of the brain above, with the pituitary (*pars anterior*) below, and with the parasympathetic nervous system, of which this area appears to be the head ganglion.

Chemical Factor.

Whatever may be the cause or causes of peptic ulcer, and however important or unimportant the relationship of hydrochloric acid to their production, it would appear to be of the greatest significance that these ulcers occur chiefly in that portion of the alimentary tract which, although secreting an alkaline juice, may be habitually exposed to acid chyme. For peptic ulcer, whether duodenal, gastric or jejunal, occurs only in those portions of the alimentary tract to which hydrochloric acid has access, and no evidence has yet been produced to show that such a lesion may arise in a stomach with gastric anacidity.

The degree of acidity and the amount of acid to which the ulcer-bearing area is subjected depend not only on an acid-producing mechanism, but also on an alkali-producing mechanism. In other words, neutralization unsecured by food is effected by this second mechanism, which comprises, in order of relative importance, three secretions: the intestinal secretion, including that of the pyloric mucosa, the pancreatic juice, and the bile.

Before the action of the pancreatic enzymes can become effective, enough alkali must be produced by these combined secretions to neutralize all acid chyme emerging from the pylorus; otherwise digestion in the intestine cannot be carried out normally.

But gastric juice will not digest healthy gastric mucosa, and it is only when the vitality of an area of mucous membrane has been sufficiently impaired, by the action of bacterial toxins or otherwise, that digestion can occur and lead to the formation of a superficial erosion, which may ultimately develop into a typical gastric or duodenal ulcer. Nevertheless, C. Keith Simpson has demonstrated hyperchlorhydria to be a potentially dangerous state, and that the association of gastritis with hyperacidity, each of subminimal intensity, may bring about erosion or acute ulcer formation. This observer produced a mild gastritis by the daily administration of five cubic centimetres of a mixture of one part of mustard oil with ten parts of olive oil prior to the first meal. He found that guinea-pigs developed multiple small erosions along the gastric pathway provided they were fed on hyperchlorhydric diets (containing 0·5% of hydrochloric acid). Higher figures of acid concentration would produce corrosive lesions without the aid of an associated gastritis.

The classical experiments of Charles Bolton demonstrated that though areas of necrosis (acute ulcers in fact) could readily be produced in certain animals, such as cats and monkeys, by the intraperitoneal injection of non-lethal doses of gastrotoxic serum, such ulcers invariably healed in ten days or so, and, moreover, it was impossible by simple damage to the gastric mucosa alone to produce a chronic ulcer. But by increasing the acidity of the gastric juice, the healing of such ulcers was delayed and they might develop into typical chronic ulcers, having all the features of peptic ulcers as they occur in man. Similar results were obtainable by combining the production of acute gastrotoxic ulcers with constriction of the pylorus. The delayed emptying of the stomach brought about in this way rendered it unnecessary to raise the acidity of the gastric juice; for the unduly prolonged action of the normal secretion upon the gastrotoxic ulcer was then sufficient to prevent its healing. Conversely, complete neutralization of the gastric contents by sodium bicarbonate not only prevented the development of acute ulcers, but also of the localized areas of necrosis.

The gastrotoxin would therefore appear to impair the vitality of the mucosal cells, and the additional destructive action of hydrochloric acid was required in order to produce necrosis. The final formation of an acute ulcer depends upon the digestion of the necrotic patch by the pepsin of the gastric juice, which ferment cannot act in the absence of free hydrochloric acid.

Following a similar line of thought, Mann and Williamson, of the Mayo Clinic, found that a typical chronic peptic ulcer frequently developed in dogs immediately beyond the pylorus after the alkali-producing mechanism (bile, pancreatic and duodenal juices) had been short-circuited into the ileum, a procedure termed surgical drainage of the duodenum. Further, Bruce Morton has demonstrated that excision of small pieces of gastric mucosa, which will readily heal in an otherwise normal canine stomach, show delay in healing after duodenal drainage, and ulcers resembling subacute or chronic ulcers frequently result. In 1930 Elman and Hartman produced spontaneous peptic ulcers in dogs by intubating the main pancreatic duct and thereby depriving these animals of pancreatic juice for thirteen or more days. Spontaneous healing resulted in two weeks upon restoration of the normal secretions. Hence, as previously indicated, the upper portion of the intestinal tract may be subjected to an excessively acid medium just as effectively by damage to the alkali-producing mechanism as by the secretion of an over-abundance of acid.

Owing to the disturbance to carbohydrate, fat and protein metabolism, surgical drainage of the duodenum leads to severe nutritional disturbance, and A. G. Weiss and E. Aron, of Strasburg, maintain that these experimental ulcers are caused not by want of regurgitation of the duodenal contents, but by lack of a certain amino-acid normally essential to health, namely, β-imidazol-α-amino-monohydrochloride-proprionic acid. These observers allege that the subcutaneous administration of histidine prevents the development of ulceration in animals in which the Mann-Williamson operation has been performed; in other words, peptic ulcer is a deficiency disease. But it is far from clear that an amino-acid deficiency really existed in these animals, nor can one be certain that ulcers ever existed or were prevented in the four animals studied. In point of fact, Mann and Williamson have transplanted the ampulla of Vater into the terminal part of the ileum, leaving the duodenum *in situ*, and only 50% of the dogs developed ulcers.

Had Weiss and Aron supported their observations by a series of experiments, using Mathews and Dragstedt's technique, and then proved that the ulcers so produced could be healed or prevented by supplying histidine, they would have been on much firmer ground. In Mathews and Dragstedt's experimental operation a terminal segment of ileum was united to a Pavlov pouch, thereby short-circuiting the entire neutralizing mechanism, with the result that a chronic ulcer developed in the ileum adjacent to the anastomosis. The pathological counterpart of this experiment is peptic ulceration of the ileum in which an associated Meckel's diverticulum, containing heterotopic gastric mucosa, is the underlying physiological basis.

The actual evidence in support of this amino-acid deficiency theory is so weak as to be almost negligible, the majority of the known facts being against this view.

"Ulcer Diathesis."

It has been assumed that the essential pathology of peptic ulcer is the same whatever its site may be; but clinically A. F. Hurst has drawn a definite distinction between the "gastric type" (long stomach) and the "duodenal or hypersthenic" (transverse stomach) individual, whose diathesis is shared by other members of his family; but even if Hurst is correct, this merely means that such individuals are physiologically less stable as regards their gastric functions than other people, not that they are more prone to the initial lesions. In order to investigate this ingenious hypothesis, simultaneous examinations by opaque meal and Ewald's test breakfast were undertaken by Professor Knud Faber. The results are shown in Table II.

Type I should represent the hypersthenic diathesis; but both in men and women with this type, instead of hyperacidity, it is anacidity that predominates. As one might have foreseen, the water-trap stomach occurs more frequently amongst sick women than amongst the healthy, but the percentage is higher amongst patients with hyperacidity than amongst those with anacidity; that is the opposite to what was to be expected according to the hypothesis. Again, even if we recognize the existence of people with an "ulcer diathesis", it is difficult to see how functional derangements can cause a single chronic ulcer.

Barnet and Thatcher (*Archives of Pathology*, December 6, 1933) report the production of gastric ulcers in albino rats as the result of a specific deficiency in vitamin B_1 uncomplicated by the factor of inanition.

At the Courtauld Institute of Biochemistry (Middlesex Hospital) Dodds and Noble have produced most dramatic pathological changes in the stomachs of animals by the subcutaneous injection of massive doses of pituitary extract (vasopressin). In fact, repeated injections of five cubic centimetres of standardized pituitary extract (British Pharmacopœia) into rabbits consistently gave rise to chronic gastric ulcers, analogous to those occurring in man.

Although these lesions are produced only when hydrochloric acid is present, they appear to be primarily related to a sudden temporary cessation of secretion. The vasopressor fraction is the only known substance which will inhibit every type of stimulus to gastric secretion. In fact, it can produce a temporary achlorhydria, during which even that most potent of gastric stimulants, histamine, will fail to produce any response.

In certain laboratories in France somewhat similar gastric lesions have been produced by stimulation of sympathetic ganglia, and there is a remote possibility that the ætiology of peptic ulcer may centre around the means of deciding what endocrine gland or what portion of the sympathetic nervous system is responsible for the gastric lesion.

Conclusion.

In conclusion, when dealing with the ætiology of chronic peptic ulcer, it is necessary to distinguish between the reason why an ulcer develops at all and why it becomes chronic.

We are forced to regard the birth of a peptic ulcer as the result of two processes: first, the initial destruction of an area of mucous membrane, by trauma, vascular disturbance or the action of bacteria; secondly, the action of the acid secretion on this area of devitalized mucosa, resulting in the development of an acute or subacute ulcer. Of these two processes the second is probably far the more important, which indeed is fortunate; for any abnormality of the gastric juice can be corrected and controlled to a considerable extent.

On any hypothesis it is not easy to explain why multiple chronic ulcers are so rare; but it seems far more reasonable to believe that acute lesions are likely to become chronic only if they occur in particularly unfavourable areas, such as the gastric pathway, than that they are especially prone to develop in these areas. Only in the pathway where the mucosa is particularly exposed to the action of the gastric juice and, incidentally, is rather closely adherent to the underlying muscle coats and therefore liable to be stretched in states of abnormal motility of the viscus, do conditions exist favourable to the development of chronic ulcers.

To sum up, the medical profession in general urgently awaits the advent of a second Moses to lead its members out of the wilderness—probably not a physician or a surgeon, but a scientist experienced in biochemistry and bacteriology, and one who can solve the problem of how these ulcers develop. Apart from this there are three other important questions which are urgently awaiting solution by the rising generation of experimental pathologists:

TABLE II.

Results of Tests of Acidity of the Contents of Various Types of Stomach (Faber).

	Condition.	Number Examined.	Transverse or Cowhorn Type (I).	J-shaped or Fish-hook Type (II).	Long or Water-trap Type (III).
Men	Healthy	70	35·1%	48·6%	15·7%
	Hyperacidity	250	33·6%	54·8%	11·6%
	Anacidity	64	51·6%	37·5%	10·9%
Nulliparous women ..	Healthy	100	11·0%	68·0%	21·0%
	Hyperacidity	63	14·3%	46·0%	39·7%
	Anacidity	47	19·1%	44·7%	36·2%

First, what are the factors inimical to the healing of an acute ulcer and aiding its transformation into a chronic ulcer?

Secondly, why does the said transformation affect only one acute ulcer so that chronic ulcers are almost invariably solitary?

Thirdly, what factors underlie the conversion of a "trouser-button" ulcer into a "mouse-hole" ulcer on the one hand and a "saddle-shaped" ulcer on the other?

Until the answers to these questions are forthcoming one feels that a great deal more progress will be made if we exhibit humility for what we have not done, rather than enthusiasm for what we have done.

THE PHYSICAL EFFICIENCY OF RECRUITS FOR THE NEW ZEALAND PERMANENT FORCES.

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Wellington, New Zealand.

IN 1934 the medical regulations for examination of recruits for the permanent forces were revised. My reasons were the following: (i) Practically no change had been made either in the method or standard of examination for many years; (ii) consequently, no account had been taken of the lessons learned from the Great War; (iii) no account had been taken of the modern methods of investigation of cardio-vascular, respiratory and nervous efficiency.

The revision provided for a more comprehensive *questionnaire* of previous illness *et cetera*, and in all cases for urine examination and for blood pressure, cardiac efficiency and Ishihara colour vision tests.

In order that there might be an equal standard throughout New Zealand, medical boards were appointed, in certain cities and towns throughout the Dominion, consisting of a president with war experience and a second medical man.

Since 1934 it has been the practice of the department to recruit batches of various sizes, for convenience of training, at intervals of a few months, and for the purpose of this paper I have taken five such groups, which total 272 candidates. This number is small, but they have been drawn from all parts of New Zealand—country and towns—and as they were recruited during the last years of the depression when unemployment was most acute, were drawn from all sections of society. Many of them had had secondary school education, and the whole may therefore be taken as a cross-cut section of New Zealand youth. The number applying, more especially for the non-flying section of the air force, were in the earlier period greatly in excess of the requirements and the senior officer of the regimental district nominated only those who appeared to be most suitable; the candidate, also, was required to supply a medical certificate of fitness from his own medical man. Unfortunately, it has been found impossible to obtain the actual number rejected before the candidate reached the board, but it has been estimated that at least 20% to 25% were obviously unsuitable. Those recruits, therefore, who eventually were passed by the medical boards were the pick of probably nearly double the number.

As I had noticed an apparent deterioration in the post-war youth of the civilian population, I considered the revised examination would be an excellent opportunity to test these impressions and prove or disprove them. Therefore, after each batch had been examined I obtained the impressions of the members of the medical boards when possible, and also of the Assistant Director of Medical Services who inspected them on arrival at the training camp. Their impressions coincided with mine: that on the average they were very disappointing in general physique and appearance. As impressions may be very deceptive, I drew up lists giving name, age, height, weight, chest measurement, blood pressure, cardiac efficiency test, urine examination, colour vision and remarks, and it is on these tables that I shall base my findings. I shall take each table separately, but before doing so shall make a few general statements. The ages of the candidates were between eighteen and twenty-four years. The minimum height standard for the artillery was at first five feet nine inches, but was later reduced to five feet eight inches. There was no minimum height standard for the air force non-flying section. Except for this, however, the medical standard requirements were the same, and I have, therefore, kept them separate only in one or two of the tables. Although I shall refer shortly to the causes of rejection by the medical boards, this paper deals with the physical efficiency of the accepted recruit. I emphasize "efficiency" because physical development is not enough; it is not sufficient that a man is six feet in height with a chest measurement of forty-two inches, but that the heart, lungs and nervous system are capable of extreme stresses and strains.

It was the experience of us all, during the Great War, to come across men who according to the accepted standards of physical development were undersized and underdeveloped and yet confounded us by the way they stood up to the hardships and dangers of active service when the apparently robust were breaking down. They were the glorious exceptions who possessed that intangible spirit of determination—the will to win.

I shall now take the various tables and deal with each in turn.

Table I gives the height of recruits in the artillery and the air force. As I mentioned previously, the minimum standard for the artillery was five feet eight inches, though only 12 out of 182 were under five feet nine inches. There was no minimum standard for the air force, and the difference is very marked, 47·8% being under five feet eight inches.

For a correct understanding of the weight standard a comparison with the height table is necessary. As there is so much variation in the height of the air force, the artillery will be taken separately, and as it would have been very wearisome and not especially

[1] Read at the fifth session of the Australasian Medical Congress (British Medical Association), August, 1937.

TABLE I.
Height.

Height.	Artillery.	Air Force.
Five feet eight inches and over	98·3%	52·2%
Five feet nine inches and over	93·4%	40·0%
Five feet ten inches and over	55·4%	22·2%
Five feet eleven inches and over	29·1%	6·8%
Six feet and over	19·2%	4·4%
Number of recruits	182	90

TABLE II.
Weight.

Weight.	Artillery.		Air Force.	
	On Enlistment.	After Two and a half Months.	On Enlistment.	After Two and a half Months.
Eight stone and over ..	3	—	6	—
Nine stone and over ..	24	5	28	5
Ten stone and over ..	70	26	33	7
Eleven stone and over ..	57	32	16	3
Twelve stone and over ..	23	10	5	2
Thirteen stone and over ..	5	1	2	1
Under eleven stone ..	53·3%	41·9%	76·6%	66·6%
Under ten stone	14·2%	6·7%	37·7%	27·7%
Number of recruits ..	182	74	90	18

valuable to take the respective heights and weights, I have taken from the 74 recruits, who were reexamined after two and a half months' training, those who were five feet nine inches in height. They were 38 in number; on enlistment they averaged ten stone two pounds in weight, and after two and a half months their average weight had gone up to ten stone nine pounds—definite evidence of underweight on enlistment.

From the total numbers it will be noticed that after two and a half months' training the average of those weighing over eleven stone had gone up to 59%, and of those under ten stone had dropped to 6·7%; and, as you will notice, th same improvement was also shown in the air force. Of one batch of 38 recruits, 34 increased from a minimum of seven pounds to a maximum of nineteen pounds, and two under ten stone had increased by nine pounds and by fourteen pounds respectively. Only one recruit showed loss of weight, from twelve stone seven pounds to twelve stone. It is worthy of note that this recruit on enlistment had a slight thyreoid gland enlargement and his cardiac efficiency test gave the figures 112/142/112 on enlistment and 100/148/108 after two and a half months' training—signs which point to an overactive thyreoid.

Recently attention has been drawn by the Royal Air Force to "body build"; and in the Air Force Publication 130 (1936) it is fully discussed and as a result of an investigation by Treadgold certain conclusions are drawn. For the information of any of you who may not be familiar with the term "body build", it expresses the relationship between age, height and weight, and is recorded in terms of weight. Three classes of "body build" are recognized, namely "normal", when the weight is within seven pounds of the average, as laid down in tables of insurance companies; "overweight", when the weight exceeds the average by more than seven pounds; and "underweight" when the weight is more than seven pounds below the average. Treadgold's conclusions reveal that overweights have capacity to endure severe or prolonged physical stress. Invaliding, through psychic disorder (indicating incapacity to endure mental stress) and on other medical grounds, is more common among "underweights": for instance, pulmonary tuberculosis is higher among the "underweights". On the other hand the "fit" underweight presents a high degree of physical efficiency. Treadgold considers that in cases of doubt the "overweight" or "normal" candidate is more likely to prove suitable than the "underweight".

Reference to Table IIA will show that 272 recruits have been taken in five batches, and of these 92 were reexamined after two and a half months' training. Among the 180 recruits 47·9% were overweight and only 9·8% underweight. Of the 92 recruits

TABLE IIA.
Body Build.[1]

Number of Recruits on Enlistment.	Overweight.	Two and a Half Months Later.	Underweight.	Two and a Half Months Later.	Normal.	Two and a Half Months Later.
54	% 37·0	% 35·8	% 5·5	% 3·6	% 57·5	% 57·6
38	23·6	50·1	26·9	4·0	49·5	36·9
92	30·3	48·9	16·2	3·8	53·5	47·2
51	62·7	—	11·7	—	25·6	—
33	40·0	—	6·0	—	54·0	—
96	41·1	—	11·8	—	47·1	—
180	47·9	—	9·8	—	42·2	—

[1] Definition.—Overweight: More than seven pounds over average weight.
Underweight: More than seven pounds under average weight.
Normal: Within seven pounds of average weight.

who were reexamined after two and a half months' training, 30·3% being overweight and 16·2% underweight on enlistment, showed an increase to 48·9% overweight and a decrease of 3·8% underweight. The marked fall in the underweight class is due to the batch of 38 recruits. Both batches reexamined were enlisted in 1935, but this batch was a particularly poor lot; and of the original 52 candidates fourteen were rejected, five for circulatory disease. The president of the medical board, when discussing them with me afterwards, somewhat cynically quoted the famous remark of the Duke of Wellington after he had inspected a particularly poor batch of recruits: "I don't know what the enemy will think of these men but, by God, they frighten me!" I can give no reason for the poor condition of these recruits, as they were drawn from all parts of New Zealand and under exactly the same conditions as those enlisted before and after. The fall of the underweight group from 26·9% to 4% after two and a half months' training is very striking, especially when one notes that the overweight group has jumped up from 23·6% to 59·1%. Taking the figures as a whole, it is evident that the New Zealander is, or rather should be, of the overweight type. It would be interesting to know what is the "body build" of the Australian, as from my remembrance of certain Australian reinforcements which I inspected in Etaples in 1918, they were of the "fit" underweight type. If this is the case, then it confirms the opinion of an Imperial officer who had been attached to both Australians and New Zealanders. He told me that if he wished to capture Hell he would ask for an Australian division, but if he had to hold it then he would prefer a New Zealand division!

Table III gives the percentages of artillery and air force (non-flying) recruits with maximum inspiration of 37 and 38 inches and over, and a chest expansion of three, four and five inches and over. It also shows the effects of exercise on 92 of the recruits after two and a half months. Standard tables give 39 inches as the correct maximum chest measurement for a male aged twenty years and five feet nine inches in height. Of the 38 recruits who were five feet nine inches in height, their average maximum measurement was only 36·6 inches, and even after two and a half months' training it had increased only to 38 inches. As 93·4% of the total artillery were five feet nine inches and over, and 55·4% were five feet ten inches and over, it is really worse than it appears from the figures, as only 27·1% were 39 inches and over. The effect of the training is here again evident but is not altogether satisfactory.

TABLE III.

Chest Measurement.

Measurement.	Artillery.		Air Force.	
	On Enlistment.	After Two and a half Months.	On Enlistment.	After Two and a half Months.
Full Inspiration.				
Thirty-seven inches and over	71·1%	81·0%	58·2%	72·2%
Thirty-eight inches and over	50·8%	67·5%	41·8%	50·0%
Thirty-nine inches and over	27·1%	47·3%	24·4%	33·3%
Expansion.				
Three inches and over ..	94·6%	93·1%	90·9%	100·0%
Four inches and over ..	56·2%	64·8%	57·7%	38·8%
Five inches and over ..	10·0%	31·0%	17·2%	22·2%
Numbers examined ..	182	74	90	18

Blood Pressure.

Table IV gives the systolic and diastolic blood pressure of 272 recruits; 180 and 92 on enlistment, and the latter again after two and a half months' training. Mercury sphygmomanometers were used in all cases; the candidates reclined on a couch and the lowest of two or three readings was taken.

TABLE IV.

Blood Pressure.

	Number of Recruits.		
	272	180	92	92 after Two and a half Months.
	Systolic.	%	%	%
120 mm. Hg. and over		93·8	93·4	90·4
130 mm. Hg. and over		65·5	69·7	60·2
140 mm. Hg. and over		32·4	35·3	18·6
	Diastolic.			
70 mm. Hg. and over		91·7	88·8	37·0
80 mm. Hg. and over		54·9	50·2	6·1
90 mm. Hg. and over		7·9	14·2	0·6

Although the importance of blood pressure readings has been exaggerated, it is, in my opinion, an essential part of every routine clinical examination. That this is the general view is shown by the insistence of all insurance companies that the blood pressure shall be recorded in all cases.

It is unfortunate that during the Great War it was taken only in a very small proportion of cases and then only in the medical wards of the hospitals, because in New Zealand essential hypertension has been accepted as an aggravation of the conditions of active service, and, I understand, this is the case also throughout the British Empire and the United States of America. During the last few years these cases have been increasing rapidly, and records of blood pressure taken on enlistment, or even as a routine in all hospital wards, would have been of great value now in assessing these claims. It may be argued that normal blood pressure is extremely variable even in the same person and on different days, but in my own experience of many thousands this variation can be reduced to a minimum by following the same technique on all occasions.

According to British and American insurance statistics, "a systolic blood pressure of 140 millimetres is unsafe; a diastolic pressure of over 90 millimetres is to be regarded with suspicion, and one of 95 millimetres and over as definitely pathological. For men and women between the ages of 20 to 24 years, the systolic pressure should be 120 millimetres, and no systolic pressure even at ages of 55 to 60 years which is more than 145 millimetres is entitled to standard rates". I quote the above because in

93% of the cases under review the systolic blood pressure was over 120 millimetres of mercury, in 65% to 69% it was over 130 millimetres, and in 32% to 35% it was over 140 millimetres. The diastolic pressure in 54% of these cases was over 80 millimetres of mercury, and in 7% to 14% it was over 90 millimetres of mercury. Of the 92 recruits examined after training, in 90% it was still over 120 millimetres although the percentage of those in whom it was over 140 millimetres had dropped to 18%. But as regards the diastolic pressure, the fall is very marked; in only 6% was it over 80 millimetres of mercury and in only 0·6% was it over 90 millimetres.

The standard figures quoted by the insurance companies are for Britishers and Americans, and the question arises, has the New Zealander a higher normal blood pressure? Space will not permit my enlarging on this question, but it is the accepted view in New Zealand. I have also noticed this increased blood pressure in pilots in the air force and in my hospital and private patients. I shall, however, refer to it later.

Cardiac Efficiency Test.

Although the cardiac efficiency test was first popularized by Sir Thomas Lewis and his co-workers when investigating "D.A.H." (effort syndrome) during the Great War, it has only recently been adopted as routine examination for recruits of the permanent forces. Nervousness and emotional factors in an otherwise "fit" recruit are common causes of an unduly rapid pulse rate; but it must never be forgotten that the candidate may be suffering from some form of toxicosis, for example hyperthyreoidism, septic tonsils *et cetera*, which may be causing cardio-vascular inefficiency. I have also noticed that the pulse rate of the "fit" nervous candidate, one minute after exercise, is always lower than the pre-exercise rate. The Royal Air Force looks with suspicion on any persistently fast pulse of over 85 per minute. This is of interest, because in the cases under review it will be found that a rapid pulse rate is the rule rather than the exception.

In Table V it will be seen that of the 272 recruits over 50% have a resting pulse of over 80 per minute and of 92 recruits after two and a half months' training in 47·7% the pulse rate is still over 80 per minute. One minute after exercise in 60% of the 272 recruits it is still over 80 per minute and in 18% it is over 90 per minute. An examination of the 92 recruits after two and a half months' training shows a great improvement, but by comparison with Royal Air Force standards the resting pulse rate is still unduly high. The question may be quite naturally asked, is this persistently rapid pulse peculiar to the New Zealander or is his cardio-vascular efficiency low? After a careful consideration of the figures and from a fairly wide experience of the civilian population, by virtue of my specialty I am of opinion that both factors are responsible. The Director of Aviation told me on his return from England that the air force medical officers had noticed this amongst the New Zealand pilots, and considered it was partly physiological, as it did not appear to affect their flying, though they had been somewhat dubious about accepting them.

TABLE V.

Cardiac Efficiency Test.

Number of Recruits.	On Enlistment.	On Enlistment.	After Two and a half Months.
272	180	92	92
"A" Resting Pulse.	%	%	%
Over 70 per minute	95·5	81·5	78·8
Over 80 per minute	59·7	45·5	47·7
Over 90 per minute	18·8	15·5	18·3
Over 100 per minute	7·6	8·3	4·3
"B" After Exercise.			
Over 110 per minute	48·7	67·8	59·4
Over 120 per minute	30·6	55·9	38·8
Over 140 per minute	2·6	8·3	4·0
"C" One Minute Later.			
Over 70 per minute	92·5	88·3	70·4
Over 80 per minute	55·9	66·6	30·8
Over 90 per minute	18·2	18·1	15·8
Over 100 per minute	5·9	11·9	2·0

Attention is called to the last six causes, which were responsible for the rejection of fourteen out of forty of the candidates. These, under the old regulations, would not have been diagnosed. Reference must be made here to the deplorable condition of the teeth; only one candidate was actually rejected for this alone, but a large number were only accepted provisionally on condition that the teeth were attended to during the probationary period and the majority only just managed to fulfil the requirements of the New Zealand regulations. It is a very serious matter, and is evidence of the fact that even in the young adult a good set of healthy teeth is the exception.

TABLE VI.

Showing Causes of Rejection in 40 Cases.

Condition.	Number.
Underweight	2
Shortening of left arm and leg	1
Malformation of chest	3
Ankylosis	1
Osteomyelitis	1
Flat foot	1
Malformed toes	1
Headache following old injury to head	1
Undescended testicles	1
Hernia	1
Defective vision	2
Colour vision (Ishihara and wool)	3
Hearing defective	2
Dental defect	1
Mental defect	1
Varicose veins	3
Haemorrhoids	1
Septic tonsils and increased blood pressure	2
Cardiac enlargement and poor efficiency	3
Cardio-vascular inefficiency and increased blood pressure	3
Hyperthyroidism	3
Nephritis	1
Glycosuria and albuminuria	2

Comment.

When mobilization for the next great war occurs, I am convinced that the whole male adult population under thirty years of age will be medically examined and placed in various gradations, and from the "A" grade the sailor, soldier and airman will be drawn. The military machine has become very complex;

the late war called for the endurance of the sailor and soldier as never before, and yet the air force was still in its infancy, and the use of gas was very crude and ineffective as compared with modern methods. It is not only the soldier whose morale will be tested to the utmost, but the civilian in the larger cities and towns will, according to many authorities, be subjected to air attacks by day and by night. I mention this because though my paper on the physical efficiency of a section of the New Zealand youth deals with the point of view of the soldier and his reaction to the stress and strain of active service, it also does call attention to a grade of physical fitness that is too low for a country which is essentially rural, which has a climate as healthy as any in the world, and in which the extreme poverty and the slum conditions of the Continental and American cities are unknown.

It is not my intention to compare this generation of candidates for recruitment with previous ones; that would be most unfair. These recruits have been subjected to tests unknown in 1914, but I am convinced that each such test has been essential and that when mobilization for war occurs they will all be included in the routine examination. For instance, the size of the thyreoid gland is no indication of hyperthyreoidism—some of the smallest may be the most active; but cardio-vascular inefficiency as shown by the cardiac efficiency test and blood pressure may point to it. There may be no signs or symptoms of essential hypertension, and yet a young adult with such a disability may be dead within a year or two. Albuminuria is frequently functional, but it may be organic and the only sign of early nephritis. Once a soldier is attested he is the responsibility of the State; if he should break down from whatever cause while on active service, he is entitled to a pension, maybe for the rest of his life. If the recruits with hyperthyreoidism, nephritis and essential hypertension have not been eliminated during the preenlistment medical examination, they will break down when called upon to endure the strain of active service; or to put it in another way, if they are not fit, as shown not by their physical development but by what is far more important, their cardio-vascular and respiratory efficiency and their nervous stability, then they should not be accepted for active service.

I would stress, however, that all tests should be taken not separately but in conjunction when the candidate's efficiency is being assessed.

I have previously referred to the accepted opinion that the pulse rate and blood pressure of the young New Zealander are on the average higher than the accepted normal of other countries. At the same time there is a very large percentage of hyperthyreoidism in New Zealand, and this, as a cause of cardio-vascular inefficiency, must not be overlooked, nor the probable effect of active service conditions upon such minor inefficiency. That it cannot be wholly physiological is shown by the effect of two and a half months' training.

You will, I think, agree that the results of these tests confirm the general impression of lowered efficiency and poor physique in the young adult New Zealander.

My time is too limited to do more than touch on the remedy, but some coordinated effort is necessary and urgent. I mentioned earlier that in the next war it may be necessary to mobilize the whole of the young male adult population, and therefore a it should be the aim of the Government not only to have physically efficient sailors, soldiers and airmen, but a healthy people. The civilian will not be called upon to fight, but he must have the morale to endure air raids and yet carry on the vital industries. The Germans, the Russians, and coming nearer home, the Japanese, are preparing for the next war, not only with increased armaments but by universal physical training, and if we are to survive we too must so equip ourselves.

In 1930 compulsory military training in New Zealand of males between eighteen and twenty-four years of age was abolished. I do not suggest that it should be restored, nor do I claim that it is the ideal method of improving physical efficiency, but it is at least a coordinated method of training. Moreover, it has obvious advantages over the ordinary gymnastic training, not only for the whole of the youth of the country, but more especially for the large majority of young adults who are too apathetic to take up sport or physical training and who are content to attend football matches or to "listen-in" to wrestling or boxing contests. They cannot be bothered to join the Territorials, and yet, if New Zealand should be in danger, these same adolescents would be the first to enlist and would be either turned down as physically unfit or would be the first to break down if accepted. Even the most ardent pacifist cannot object to any measures which will make for the improved health of the young adults. England has awakened to the necessity for some coordinated plan, but in New Zealand no serious attempt has as yet been made to deal with the problem, although I know that the Government not only realizes the state of affairs but is ready and anxious to approve some practical plan for the physical improvement of the New Zealand youth.

From fourteen years to twenty years of age is the critical period of the youth; he is passing from boyhood to manhood. While he is at school his work and his play are balanced and controlled, but a large number of boys begin to leave school from fourteen years onwards, and go to work in office or factory. Except during working hours they have no restrictions, and unless they are specially keen on sports they are content to drift. If a government considers it is responsible for the education of the children and compels them to go to school, is it not equally responsible for the physical efficiency of the nation? When these boys leave school their employers will train them in their vocation, but what is the good of an expert craftsman if he is underdeveloped and unfit?

Some years ago H. G. Wells wrote "The War of the Worlds", in which the Martians invaded England; they were depicted as having huge brains with very attenuated legs and arms. Although they were at first invincible because of their vastly superior intelligence, they quickly succumbed to disease which they had not the physical efficiency to resist.

In conclusion, the following quotation from Michel de Montaigne is appropriate:

> I would have his outward behaviour and mien and the disposition of his limbs formed at the same time as his mind. It is not a soul, it is not a body that we are training up; it is a man, and we ought not to divide him into two parts nor to fashion one without the other.

PERIARTERITIS NODOSA, WITH A REPORT OF TWO NEW CASES.[1]

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PERIARTERITIS NODOSA is considered a relatively rare disease. Rothstein and Welt,(1) in 1933, were able to find 195 recorded cases. During the course of over 4,000 *post mortem* examinations performed since 1920 at the Adelaide Hospital and at the Mental Hospital, Parkside, most of which have been carried out by myself, three cases of this disease were found. One of these was reported by me(2) in 1923. The patient was a boy, aged eighteen years, and it was a classical case with typical lesions in the heart and kidneys, with great emaciation and with moderate leucocytosis.

The second patient was a man, aged fifty-one years, who died somewhat suddenly on March 26, 1935, death being due to rupture of one of the lesions of this disease in the liver. This had led to a hæmorrhage which first of all separated the capsule of the liver from the liver itself, and then the capsule burst with fatal bleeding into the peritoneal cavity. The intraperitoneal hæmorrhage was first noted. As I proceeded with the autopsy I found a hæmorrhagic mass in the mediastinum, and what I took to be hæmorrhagic glands near the pancreas. There were also lesions in the kidneys, in one testis, on the serous coat of the stomach, and in the mesentery near the attachment to the intestines. Towards the end of the autopsy I realized that the case might possibly be one of *periarteritis nodosa*, although perhaps uppermost in my mind was the idea that the condition was due to a hæmorrhagic newgrowth. In the brain were old hæmorrhages. Microscopic examination revealed the real nature of the condition, and the hæmorrhages of the brain were, I think, part of the same process, though this was not fully established.

The third patient was a messenger boy, aged fifteen years, who died, on July 11, 1936, from uræmia due to subacute glomerulonephritis. In this case *periarteritis nodosa* was recognized only when microscopic sections from the kidney were examined. These lesions were unmistakable, and the glomerulonephritis seemed possibly independent of them. In addition, the boy had rows of typical rheumatic vegetations on the mitral cusps. These aspects will be further considered later.

[1] Read at the fifth session of the Australasian Medical Congress (British Medical Association), August, 1937.

These three cases illustrate the protean manifestations of this disease. None were recognized during life. One was definitely diagnosed during the *post mortem* examination. The mental hospital case was suspected as possibly being of this nature during the autopsy. The third case, in which the boy suffered from glomerulonephritis and died of uræmia, was recognized only when a microscopic examination was made of the kidneys.

Histories.

CASE I.—*Periarteritis nodosa* with typical lesions in the heart, liver and kidneys, in a boy aged eighteen years, was the case already recorded. The patient was in hospital for over seven weeks with an irregular temperature, varying from remittent to intermittent, with leucocytosis (the leucocytes varying in number from 13,600 to 20,000 per cubic millimetre), and with great emaciation. Aneurysmal dilatations were numerous on the branches of the coronary artery and in the kidney, in the latter situation giving rise to infarcts. Lesions were also found in the liver.

This case may be considered one of the classical type.

CASE II.—In the second case the condition was *periarteritis nodosa*, death resulting from subcapsular hæmorrhage of the liver and from final rupture into the peritoneal cavity. G.A.P$_y$, a male, aged fifty-one years, had been an inmate of the mental hospital at Parkside since January 25, 1916, suffering from delusional insanity. On January 27, 1935, he collapsed, and on examination was found to have a slight left-sided paresis. No other definite neurological signs were detected. On January 31 he was transferred to the infirmary ward for special care and treatment, and here his paresis seemed to decrease. He died somewhat suddenly on the morning of March 26. No Wassermann test had been carried out.

At the autopsy death was found to be due to a subcapsular hæmorrhage from the liver. In the peritoneal cavity itself there were several handfuls of blood clot and about ten ounces of fluid blood; this had escaped from under the capsule of the liver, which was separated from the underlying liver substance, over nearly the whole of the upper surface of the right lobe, by blood clot. In this capsule was a small rent about 5·0 centimetres (two inches) long in front near the lower border. When the liver was incised a lesion about the size of a cherry stone was found near the surface, and there were one or two paler patches suggesting fatty changes. A large hæmorrhagic growth 3·75 centimetres (one and a half inches) in diameter and a smaller one the size of a lentil were found below the bifurcation of the trachea. On the anterior aspect of the serous coat of the stomach, near the lesser curvature, was a hæmorrhagic nodule the size of a marble, and several other such nodules were found along the attachment of the omentum. In the mesentery of the small intestine, close to the gut, were several cherry-sized hæmorrhagic nodules, and there was another near the wall of the colon; two of the small nodules near the intestine actually formed prominences under the mucosa. Similar hæmorrhagic nodules were mistaken for glands around the pancreas. In the right kidney were four hæmorrhagic areas, the biggest about 1·8 centimetres (three-quarters of an inch) in diameter, and there was one such area in the left kidney; the kidneys were small and rather tough, and the cortex perhaps was somewhat reduced, the right weighing four and a half ounces and the left three and a half ounces. In the right testis was another of these hæmorrhagic areas. The spleen and suprarenals seemed normal. The vessels at the base of the brain showed advanced but patchy atheroma. When the right lateral ventricle was incised, degenerated-looking tissue, discoloured with blood clot, probably some weeks old and partially encapsuled, was found extending into the thalamus for about 0·6 centimetre (a quarter of an inch).

Microscopic examination of the various lesions revealed proliferation of the intima by fibroblasts, and the presence of inflammatory cells, such as polymorphonuclear cells and plasma cells and lymphocytes, with much blood clot in the neighbourhood. In the liver a number of polymorphonuclear cells were seen in Glisson's capsule and in between the liver cells; many of these polymorphonuclear cells were degenerating. Sections of the thalamus showed old blood pigment with foam cells and hyaline degeneration of the vessels, which seemed contracted; and in some cases the lumen was nearly occluded. There was not much cellular reaction in the wall, but there were a few proliferating cells in the perivascular tissues.

CASE III.—The condition in the third case was *periarteritis nodosa* with subacute glomerulonephritis and rheumatic vegetations on the mitral valve. B.W., a messenger boy, aged fifteen years, was admitted to the Adelaide Hospital on May 18, 1936, under Dr. W. Ray, complaining of pains in the back. He had had tonsillitis before the onset of the present illness, which had begun three weeks previously with pains in the lower part of the back, followed by swelling of the legs and pain in the backs of the legs. He went to bed and there his face began to swell, mainly under the eyes. The pain behind his knees had been severe, and he had been vomiting after his meals. His previous illnesses consisted of measles and of the tonsillitis that had occurred a month before his admission to hospital. His two brothers, a sister and his parents were healthy.

On examination his temperature was found to be 36·8° C. (98·2° F.); the pulse rate was 88, and the respirations numbered 20 per minute. The systolic blood pressure was 125 and the diastolic blood pressure 80 millimetres of mercury. He was a rather pale boy, lying in bed in no distress, with a moist, furred tongue; the tonsils were reddish, with a few whitish patches. The pulse was regular and of good volume and tension. The lungs seemed normal; the abdomen was tender in both loins; the reflexes were normal. The urine had a specific gravity of 1,020, and it contained much albumin and blood. On May 19 microscopic examination of the urine revealed many polymorphonuclear cells, some red blood cells and a few hyaline casts, but no microorganisms were detected.

He was treated as suffering from acute nephritis. The temperature rose to 38·9° C. (102° F.) on the evening of his admission to hospital, falling next day to 37·1° C. (98·8° F.); for the next few days the evening temperature gradually fell until it reached normal on May 28. By June 1 the evening temperature began to rise again, the morning temperature being slightly lower. This oscillating temperature was maintained till June 21, when the morning temperature also rose above normal. From this day till just before the patient's death the evening temperature ranged from 38·4° C. (101° F.) to 39·5° C. (103° F.) (occasionally), with the morning temperature 37° C. (98·8° F.) to nearly 37·8° C. (100° F.). Just before his death the temperature rose a little higher, and then there was a rapid descent to subnormal at the time of death on July 11.

The blood in the urine had disappeared by May 25; the absence of œdema was noticed on May 28; but the albuminuria continued. On June 11 the patient was noted to be very pale, and blood examination next day revealed 4,000,000 erythrocytes and 15,000 leucocytes per cubic millimetre. The hæmoglobin value was 59% and the colour index 0·7. Anisocytosis, with some pallor and some polychromatophilia, was present; numerous platelets were seen. Eosinophile cells numbered 0·7% in the differential count, and the number of leucocytes revealed a mild neutrophilia. The picture was that of a secondary anæmia of hypochromic type, suggesting chronic loss or destruction; in this case it was considered as being possibly of infective origin.

On June 15 the patient still had much albumin in the urine. A urea concentration test, carried out on June 10, revealed the facts shown in Table I.

On June 25 a soft systolic murmur was heard at the apex of the heart; the temperature was still high. On

TABLE I.

Time.	Amount of Urine in Ounces.	Specific Gravity.	Urea Concentration Percentage.
10 p.m.	2·0	1,020	1·4
6 a.m.	9·5	1,014	1·8
8 a.m.	3·0	1,014	1·6
9 a.m.	2·0	1,010	1·5

June 28 the patient was given a transfusion of ten ounces of blood. On July 2 his colour was much improved. On July 6 he complained of feeling "tight in the chest". The systolic murmur at the apex had become much harsher in quality and there was a reduplicated second sound over the pulmonary area. Early on the morning of July 10 he had a sudden pain in the chest, accompanied by breathlessness; the pulse rate was 140 and the respiration rate 40. A systolic murmur with gallop rhythm was present. Next day gallop rhythm was still present, and the patient died on the morning of July 12.

At *post mortem* examination the body was seen to be that of a thin lad, less developed than his age would indicate, with a little œdema of the legs. There was very little subcutaneous or abdominal fat. No pleural adhesions were found, but a slight excess of clear fluid was seen in both pleural cavities. The heart was somewhat hypertrophied for the age of the patient, weighing eleven ounces. The heart muscle was a little pale. On the auricular aspect of the mitral cusps and just within the margin were rows of minute bead-like vegetations. The kidneys weighed seven and a quarter ounces each, being unduly large; the capsule peeled away and left a smooth surface, on which the stellate veins were very prominent, and accompanied by darker mottled red patches, probably from small hæmorrhages. The cut surface showed an ill-defined demarcation of the medulla and cortex, with the cortex narrowed over the pyramids, mottled red and white, and presenting a slightly granular appearance when viewed obliquely. All vessels appeared as red lines in the cortex and medulla, and the small arteries projected slightly. The base of the right lung was rather œdematous, but there were no other lesions of importance.

Microscopically, some of the glomeruli of the kidney were almost normal, with, perhaps, increase of nuclei and enlargement of the capsular space; others showed the tuft adherent in places to the capsule; some had areas of hyaline fibrosis in the tuft, and in occasional glomeruli the capsular space was obliterated and the glomerulus was being converted into connective tissue. No proliferation of the capsular epithelium had occurred; polymorphonuclear cells were present sometimes near the glomeruli; hyaline casts were found in some of the tubules. Both large and even quite small branches of the renal artery showed changes of two kinds: one, the peculiar fibrinous-looking necrosis of the middle coat more particularly; the other, proliferation of cells in the intima, leading in some cases to occlusion of the lumen with proliferation in the other coats as well. Small infarcts were also seen in areas supplied by occluded vessels, as well as thromboses and small hæmorrhages.

Discussion.

In Case I, already reported, death must be attributed to the direct results of the late lesions of *periarteritis nodosa*, affecting more particularly the kidneys, but also the coronary vessels. It is probable that the acute stage was over and that some degree of healing was taking place in the

lesions, but the damage to the vessel walls led to aneurysmal dilatations and to secondary changes in the tissues supplied by this vessel.

The mental hospital patient died suddenly as the result of rupture of an aneurysmal dilatation in the liver. The *periarteritis nodosa* was shown during life by the occurrence of paresis due to lesions in the brain. The other lesions of *periarteritis nodosa* did not presumably give rise to symptoms until hæmorrhage occurred under the capsule of the liver. The lesions in this case must also be considered as the aftermath of a more acute stage.

The third patient died from glomerulonephritis. It is probable that the lesions of *periarteritis nodosa* in the vessels of the kidneys facilitated the fatal result and were possibly also directly responsible for the glomerulonephritis. These lesions might be considered to have been in part at least still in the acute or subacute stage.

The two boys had an irregular type of temperature, and in both cases moderate leucocytosis was present. In the case of the adult observations were not made along either of these directions.

Significance of Association with Rheumatic Fever and Glomerulonephritis.

The third case is the most important one in the series, inasmuch as typical lesions of rheumatic fever were present in the heart, and the glomerulonephritis, perhaps in part, was independent of the lesions in the vessels. The association of *periarteritis nodosa* with rheumatic fever has been noticed on previous occasions, as by Rothstein and Welt[1] in a boy of seventeen, and by Victor Neale and Whitfield[3] in a boy aged fifteen years. The association with glomerulonephritis is also recognized, though in the majority of cases the lesions in the kidneys are purely those due to the vascular condition.

Is there any likely association of these three conditions with each other? The view probably most widely accepted now as to the nature of *periarteritis nodosa* is that the lesions are the result of an allergic (hyperergic) response to some infective agent, or possibly agents of different kinds. The necrosing changes in the middle coat of the arteries, with occasional infiltration by some eosinophile cells, might readily be explained by such a reaction. It has also been suggested that some forms of acute and subacute glomerulonephritis, that is, those not classifiable as embolic nephritis, may be the result of an allergic reaction. Allergy has also been invoked as a possible cause of the lesions in rheumatic fever. The Aschoff's nodes, however, seem to me to suggest the location of an infective agent of some kind rather than the kind of response that might be expected in an allergic reaction. There seems a definite relationship between *periarteritis nodosa* and rheumatic fever, and it is possible that the former disease is in some cases an allergic response to the agent of rheumatic fever.

Syphilis as a cause of *periarteritis nodosa* can be ruled out of court. The only other theory of general acceptance as to the ætiology is that the disease is due to an infective agent of some sort, possibly a virus or a rickettsia. So far, however, no infective agent has been established. The condition also has resemblances to *thrombo-angiitis obliterans* and to *thrombo-phlebitis migrans*. Since my third case, associated with glomerulonephritis, I have been more impressed with the view that the condition is an allergic response, though I still think there is much also in favour of a specific infection.

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THE SUPERVISION OF AIR TRAFFIC FROM OVERSEAS AND ITS ATTENDANT RISKS.[1]

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FRONTIER DEFENCE against international exchanges of disease has undergone progressive developments in adjustment with the changes in travel.

In the days of sailing ships and camel trains, which were also the days of complete ignorance of the factors in the transmission of disease, the measures applied were vigorous and sometimes brutal, but they were, as we know now, far in excess of actual needs. With the development of steam traffic by land and sea and the consequent acceleration in speed of travel, measures had to be modified in order to prevent complete confusion, and they became adapted to the increasing knowledge of epidemiological principles. For nearly eighty years these practices have been slowly perfected in accordance with increasing knowledge, and the principles have become stabilized for all countries with little variation in practice. These principles consist largely of a recognition of two cardinal factors: the method of transmission and the incubation period of the disease. So that while measures were applied, such as vaccination against smallpox, destruction of rats for plague, and supervision of food and water for cholera, the only delay imposed upon traffic was that imposed in accordance with the period of incubation for the particular disease concerned. Even this delay was applied to the personnel of a steamer, in accord with the degree of exposure to infection of the respective sections of the ship's company.

Now, with the dramatic development of air transport between countries, the whole position has had

[1] Read at the fifth session of the Australasian Medical Congress (British Medical Association), August, 1937.

to be reviewed. In countries situated in such close proximity as the European countries there is for all practical purposes no control in respect of quarantine measures. This has resulted from a recognition of the uniformity of the disease picture throughout this region and the practical impossibility of imposing any satisfactory measures. In other parts of the world, however, the situation presents different features, and for the purposes of this paper two regions might be cited.

Yellow fever in Africa and America has for many years been recognized as a potential danger to other countries, particularly to Asia. Before the days of air transport the apprehension amongst health authorities in Asia at the possible introduction of this disease was directed towards America, and fears were entertained that, with the opening of the Panama Canal, special measures would be necessary to protect Asia against steamer traffic by that route. This potential danger actually still exists, and measures have from the beginning been applied to steamers travelling towards Asia by that route. We have now the accumulated experience of some twenty years, which justifies at least the statement that yellow fever has not reached Asia by that steamer route. That the possibility of the transmission of mosquitoes from the American coast to the Asian coast still exists must be recognized; but whatever the reason may be, at least we know that yellow fever has not been transported to Asia. There is also no record of any steamer having reached the Asiatic coast with persons either infected on arrival or having been infected during the voyage.

In these days, however, great concern is felt that, with the introduction of direct air traffic from Africa to Asia, mosquitoes infected with yellow fever may be transported and yellow fever may be introduced into Asia, with disastrous results of a magnitude that can only be imagined.

The other region is our own region of Australia, and we must recognize the great increase in the danger to which we have always been exposed, of the introduction of diseases from Asia to Australia.

While these two regions have been especially indicated, this general international risk has been recognized as affecting all countries, and an international convention, known as the International Sanitary Convention for Aerial Navigation, has been deliberately prepared and has now been accepted by all the leading countries in the form of an official treaty. The principles contained in this convention are the following.

Primarily, the signatory countries agree to regulate by mutual consent the sanitary control of aerial navigation on international routes. In the first place the convention deals with the major quarantinable diseases — plague, cholera, yellow fever, typhus and smallpox. Other infectious diseases may be dealt with in accordance with customary local measures.

Provision is made for establishment by signatory countries of "authorized aerodromes", at which aircraft from other countries make their first landing, and "sanitary aerodromes", which are staffed with an organized medical service and equipped with means for isolation and care of the sick and for disinfection. General measures provide for the medical inspection of all on board aircraft, for the prohibition from embarkation of persons with symptoms of infectious disease, and for reciprocal notification of epidemiological intelligence.

In the event of infection of a local area with plague, cholera, typhus or smallpox, passengers and crews of departing aircraft may be inspected, cases or contacts may be excluded and the aircraft may be subjected to necessary disinfection. In the event of aircraft arriving with a case of one of the diseases specified by the convention on board, the usual quarantine procedure is prescribed—inspection, isolation of cases and disinfection; vaccination against cholera and smallpox is recognized as qualifying contacts for release under surveillance.

A special chapter of the convention deals with yellow fever. Signatory countries agree to take steps to ascertain whether yellow fever exists in their territories in a form not clinically recognizable, but which can be revealed by biological examination (such foci persist in central South America and in Africa). In regions where yellow fever exists, provision is made for the establishment of "anti-amaryl aerodromes", which are mosquito-free and situated at an adequate distance from the nearest inhabited centre; this provides for their continued freedom from the mosquito vector, *Aëdes* (*Stegomyia*) *ægypti*, with its "domestic" habitat.

When aircraft leave an area infected with yellow fever, the convention provides for medical inspection of passengers and crew, with a search for mosquitoes on board and, if necessary, insect destruction. Persons suspected of symptoms of sickness or who have been exposed to infection must remain under observation within the precincts of the aerodrome or under conditions approved by the sanitary authorities for six days (the period of incubation for yellow fever). Within infected areas air traffic is permitted only between anti-amaryl aerodromes.

In countries where yellow fever does not exist, but where there are conditions which would permit of its development (that is, where *Stegomyia* are present), inward medical inspection of aircraft, passengers and crew is provided for, with insect destruction and observation of suspects or possible incubating cases over the six days' incubating period of risk. Particular sanitary aerodromes may be designated for the landing of aircraft from countries where yellow fever exists.

The convention came into force four months after its ratification by ten countries; this was completed on April 3, 1935, Australia being one of the original countries which ratified the agreement.

Precautions taken before departure of the vessel are obviously likely to be of greater value than pre-

cautions on the arrival of the vessel, although provision is made in the convention for appropriate measures to be taken if an aeroplane arrives with any persons on board infected with any of the diseases specified by the convention.

While, however, measures taken both before departure and on arrival are valuable, both depend for their efficiency upon an international system of cooperation. Under the direction of the League of Nations and the *Office International d'Hygiène Publique*, an international system of notification has now been developed which is highly efficient, and air traffic—as much as steamer traffic, and perhaps more—depends upon this international system of notification.

In addition, the convention provides that each air vessel shall carry a log-book, in which the necessary endorsements are made at each place of call by the health officials. An example of this system is afforded by one of the most recent arrivals in Australia—Mrs. A. Earhart Putnam.

By arrangement, the air port health officer at Karachi notifies the Eastern Bureau of the Health Organization of the League of Nations, Singapore, of all arrivals by air from the yellow fever areas of tropical Africa. The Eastern Bureau in turn notifies all other eastern countries of transit and destination. Mrs. Putnam, with her navigator, in the Lockheed Electra aeroplane, crossed the yellow fever area of Africa from Dakar via Gao and Fort Lamy to Khartoum. Her arrival at Karachi was reported to Singapore, to Canberra and to Darwin direct. Leaving Khartoum on June 13, 1937, these aviators remained under international quarantine surveillance until the time of their delay in Java. Actually, therefore, when they were cleared on inward medical inspection by the quarantine officer at Darwin on June 28, the period of risk was definitely over.

This example shows how, from Africa through Asia to Australia, a system of continuous surveillance is maintained, even in a particular instance in which the possibility of infection must be considered to be very remote.

Two aspects are of practical importance in relation to the possibility of the introduction of disease.

People who travel by aeroplane come from a class both pressed for time and able to afford good accommodation at each of the places of call on the journey. This is not the class from which the transmission of disease is to be expected. Our experience shows that infection is almost invariably carried by the crew or the passengers travelling in the cheaper classes. This means, in practice, that the passengers do not delay on their journey and are most likely to stay in hotels and other establishments where precautions against impure food are part of the routine.

Landing places for aeroplanes arriving from overseas have been proclaimed at Darwin, Wyndham and Brisbane, and for seaplanes at Darwin, Thursday Island, Brisbane, Wyndham and Broome. Hospitals are available at each of these places, and a Commonwealth health laboratory has recently been established at Darwin, which will be of great value in the diagnosis of disease in passengers arriving from overseas.

The eastern route of mail planes from Darwin is via Daly Waters, Newcastle Waters, Brunette Downs, Camooweal, Mount Isa, Cloncurry, Winton, Longreach, Blackall and Charleville. At Charleville the passengers transfer to an aeroplane for Brisbane, but the mail is carried on via Bourke to Cootamundra, where it is transferred to the train for Sydney. The aeroplane stays for the night at Longreach. Medical men and hospitals are available at a number of these places should oversea passengers become ill *en route*.

The western route is through Daly Waters, Derby, Broome, Port Hedland, Onslow, Carnarvon and Geraldton, and is adequately provided with a quarantine organization operating with respect to all maritime traffic.

The southern air service from Darwin to Adelaide now exists through Catherine, Daly Waters, Tennant's Creek, Alice Springs, Oodnadatta and Farina. Hospital accommodation is available at Tennant's Creek, where the aeroplane stops for the night, and hospital accommodation is being considerably extended at Alice Springs at the present time.

In guarding against the introduction of disease, the use of prophylactic inoculation in conferring immunity against particular diseases will always play a large part. Immunity is conferred against smallpox by vaccination with calf lymph in very nearly 100% of cases.

Cholera vaccine is found to give immunity in about 80% of persons vaccinated. The immunity, however, does not appear to be a very persistent one, and lasts only for a maximum of three or four months.

In the case of plague, the inoculation with Haffkine's vaccine gives a very large measure of protection against the disease and causes a considerable reduction in the case mortality.

Considerable work has been done in the production of vaccine against yellow fever, and various methods of vaccination are available. It has been noted that the Pan-American Airways have issued instructions that all their personnel shall be vaccinated against yellow fever at Rio de Janeiro.

If each of the diseases is considered in respect of these general principles, a brief indication of the risks may be given.

In respect of smallpox, the liability to infection of any individual in Asia is perhaps greater than in respect of the other quarantinable diseases, but the Australian regulations provide against this by requiring that each person shall produce a certificate of vaccination on arrival, and if this certificate is not produced the person is vaccinated at the Australian point of entry.

Plague is transmitted from country to country, not by persons but by infected rats, and the possi-

bility of the transport of an infected rat by an aeroplane must be regarded as extremely small.

Cholera is not likely to be transmitted by any food articles or water carried on the aeroplane. It may happen that a person travelling by aeroplane has become infected with cholera in Asia, but this would declare itself rapidly, and adequate precautions could be taken when the disease was discovered. The convention prohibits the carriage by aeroplane of articles of food which are especially associated with cholera. The fact that during twenty-eight years of Commonwealth quarantine activity no person has arrived by steamer infected with cholera indicates further that the chances of cholera being transmitted by aeroplane are quite small.

The large group of the commoner infectious diseases—measles, whooping cough, diphtheria *et cetera*—has always to be considered in respect of any international migration by whatever route. Cases are apt to occur from time to time, but they present to Australia only an added individual case of a disease already prevalent throughout the Commonwealth. The measures taken in respect of such cases would be precisely those taken in respect of a similar case occurring amongst the population already resident within Australia, and medical staff and hospitals are available at each point of call to deal with such cases.

It is in respect of the mosquito-borne diseases that the greatest apprehension is felt, and these diseases are yellow fever, dengue fever and malaria.

In respect of yellow fever, the time factor operates to cover any risk to Australia so long as conditions remain as they are. The most rapid flight which is possible under existing conditions was that made by Mrs. Putnam, and, as will be seen from the facts already quoted, her time of surveillance expired before her arrival in Darwin. Commercial flights are not likely for many years to be any more rapid than this record-breaking flight. If, however, Asia became infected with yellow fever, then clearly the situation would become more serious.

Dengue fever and malaria do present a more imminent risk, and each of these two diseases has its own features. A person may well arrive in Darwin incubating dengue fever and manifest the disease after he has landed from the aeroplane, with the possibility of starting a local epidemic. It is difficult to see how any administrative measures can control this risk. The burden of protection must be carried by the local organization at the place at which the patient is isolated. Infected mosquitoes may conceivably be carried, but, as will be shown presently, this possibility is covered.

In respect of malaria, it is equally true that an infected mosquito may be transported, but this risk is comparatively small when contrasted with the greater probability of a person infected with malaria travelling by air. Probably scores of such persons enter Australia by steamer every year—persons liable to recurring attacks of malaria during which they are infective; and it has never been suggested that such persons should be excluded from any country by any quarantine organization. In fact, such international migration is continuous in every country.

All countries have recognized the desirability of measures to prevent the international transport of living mosquitoes. The international convention provides appropriate measures and, so far as Australia is concerned, those prescribed require each vessel to bring a certificate that it has been treated at the last place of call with an effective mosquito-destroying agent. This practice is faithfully observed, and from time to time a supplementary treatment of the aeroplane is given immediately on arrival of the air vessel at Darwin.

There remains one other aspect which has from time to time been considered, namely, the possibility of the transport of infective material on the wheels of the aeroplane. So far as human diseases are concerned, this need not be further considered. We know of no disease which is liable to be so transmitted. In respect of animal diseases, this contention has been advanced, but as yet proof of its possibility is lacking.

It is expressly provided that animals and plants may not be imported by air.

The possibility of the transport of seeds of weed pests and possibly of plant diseases is much greater than it is in respect of diseases of animals or man.

Acknowledgement.

My acknowledgement is due to Dr. F. McCallum, senior medical officer of the Commonwealth Department of Health, who has assisted me very materially in the compilation of this paper.

A PRELIMINARY SURVEY OF THE TYPES OF CORYNEBACTERIUM DIPHTHERIÆ ISOLATED AT THE METROPOLITAN INFECTIOUS DISEASES HOSPITAL, NORTHFIELD.

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DURING the period from July, 1937, to January, 1938, an endeavour was made to establish the presence or otherwise, in Adelaide, of the various types of *Corynebacterium diphtheriæ* described by Happold, Anderson, McLeod and Thompson in 1931. Accordingly, pure cultures were isolated from swabs being taken from the noses and throats of a number of selected patients admitted to the Metropolitan Infectious Diseases Hospital during this period. At this time, 39% of the patients admitted to hospital came from one district—Port Adelaide—and of the seven patients who died from diphtheria during this period, five were from the same district. The patients from whom pure cultures were isolated were chiefly from this district; but in addition, the organisms from the first patient from a new district and from any very sick patient were also typed.

The Results of the Survey.

Altogether 68 pure cultures were obtained and typed, giving 32 "gravis" and 36 "mitis" forms. At no time was an "intermediate" type isolated. All persons with "gravis" infection in this series came from the Port Adelaide district, with the single exception of a nurse, a member of the staff of the hospital who had been previously Schick-tested and found not to react.

Of the 110 patients admitted from Port Adelaide district, 27 came from an orphanage and therefore had very little contact with the outside world. None of the patients was very ill. In several of these cases the organisms were typed and found to be "mitis".

Of the 68 cultures typed, four were obtained from children who had received three immunizing injections of anatoxin at periods ranging from three months to eighteen months previously. No Schick test had been carried out at the end of treatment. From these, three of the "mitis" type were isolated (one from a carrier of virulent organisms, the other two from patients with mild clinical diphtheria) and one "gravis" (the patient having a moderately severe attack of diphtheria).

TABLE I.

Types of Organisms Isolated from Patients who had received Injections of Anatoxin.

Type.	Number of Cases.	Clinical Features.		
		Carriers.	Mild.	Severe.
"Mitis"	3	1 (Virulent)	2	0
"Gravis"	1	0	0	1
Total	4	1	2	1

In six other instances the patients had been in hospital with diphtheria from four months to four years previously, one being a carrier and the other five suffering from clinical diphtheria for the second time. In four of these cases the "gravis" and in two the "mitis" type was isolated.

TABLE II.

Types of Organisms Isolated from Patients who had Recovered from Diphtheria.

Type.	Number of Cases.	Clinical Features.				Deaths.
		Carriers.	Mild.	Moderate.	Severe.	
"Mitis" ..	2	1	0	1	0	0
"Gravis" ..	4	1	1	0	2	1
Total ..	6	2	1	1	2	1

Clinically the severer "mitis" infections were characterized by profuse membrane formation, less tendency to the severer forms of complications, such as peripheral neuritis and cardiac and ophthalmic complications *et cetera*. Only two deaths occurred in this group: one patient, a child aged eight months, had laryngeal involvement requiring tracheotomy; the other was a neglected patient.

The severer cases of the "gravis" group, on the other hand, showed less tendency to membrane formation, marked tendency to complications and consequent prolonged convalescence. There were five deaths in this group. Two deaths occurred within forty-eight hours of the onset of symptoms. One case was missed, and the patient was not admitted to hospital until three weeks after the onset of a sore throat; this patient died from diaphragmatic paralysis four weeks after admission, that is, seven weeks after the onset of symptoms.

All grades of infection, from carriers to severe clinical diphtheria, have been noted with both types of infection.

TABLE III.

Grades of Infection with Different Types of Corynebacterium Diphtheriæ.

Cultural Types.	Number of Cases.	Clinical Types.				Deaths.
		Carriers.	Mild.	Moderate.	Severe.	
"Mitis" ..	36	2	11	11	12	2
"Gravis" ..	32	2	7	10	13	5
Total ..	68	4	18	21	25	7

Method of Examination.

1. Tellurite plates (Horgan and Marshall) were inoculated directly from swabs and colonial characteristics were noted. These showed some variation from those described by various workers; but others, apparently, have noted similar variations.

2. Subcultures were then made on Löffler slopes. These were incubated for twenty-four hours and the morphology of the organisms was noted.

3. Tests of fermentation of galactose, glucose, saccharose, glycogen and starch were made. The results of fermentation tests were consistent throughout, the "gravis" type invariably producing acid in galactose, glucose, glycogen and starch, the "mitis" type producing acid in galactose and glucose only. At one stage peptone water was used as a vehicle for the carbohydrates serving as a check when Hiss's serum water was used. On three occasions there was a reversion to alkalinity in two to four days with starch only. As this fact was never noted when Hiss's serum water was used, that is now used as routine.

4. The type of growth in broth was noted. It was found to be fairly consistent with that described by Anderson, Happold, McLeod and others.

5. Hæmolysis was tested for by the Hammerschmidt method, with the result that 64% of the "mitis" types were found to be hæmolytic and 75% of the "gravis" were non-hæmolytic. Virulence was tested only in the case of carriers. A large enough number of tests was not done, however, to warrant the drawing of any conclusions.

All media were checked by the use of known strains of "mitis", "intermediate" and "gravis" types obtained from the Commonwealth Serum Laboratories and three cultures were sent to the Commonwealth Serum Laboratories for confirmation.

Conclusions.

1. Both "gravis" and "mitis" types of *Corynebacterium diphtheriæ* are present in Adelaide.
2. "Gravis" infections are severer than "mitis", respond poorly to antitoxin and have a greater tendency to complications, resulting in protracted convalescence.
3. The "intermediate" type has not yet been isolated at the Metropolitan Infectious Diseases Hospital.

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SOME ASPECTS OF MAXILLARY ANTRUM INFECTION.[1]

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Sydney.

THIS article is not intended to cover the whole subject mentioned, but to try to answer some controversial points.

Every medical practitioner has heard the remark "I don't want to have my antrum operated on"; and I am afraid some practitioners say it themselves and advise their patients accordingly. An attitude of deadly fear has thus been created in the public mind, and a great many people with infected antra put off coming to have them treated until the disease is too widespread or until they have a chronic chest infection which will not yield to any treatment. What I should like to impress on our profession as a whole is that antrum infection is easy to treat in the early stages, the earlier the better; and it is up to them to recognize it. I will go into the means of recognition later, for the moment saying only that it is not always as easy as it would appear. When I state that early cases are easy to treat, I am referring to the ordinary type of infection, not to the occasional fulminating infection which we find here as elsewhere in the body, which appears and starts a general blood infection or a sinus thrombosis almost as soon as it originates.

The public attitude previously mentioned is unfortunately justified to some extent, (i) because we, the specialists, have different ideas as to treatment, and (ii) because some years ago the surgical fashion became so radical that turbinates and lateral nasal wall often went by the board; the nasal mucous membrane was so reduced in area that a condition which may be called artificial atrophy was produced, and the late state of those patients was worse than the first.

The problem shows us two different age aspects, children and adults, though it is very hard to give a definite dividing age.

[1] Read at a meeting of the Section of Oto-Rhino-Laryngology of the New South Wales Branch of the British Medical Association on March 16, 1938.

Maxillary Antrum Infection in Children.

Antrum infection is much more common in children than most practitioners realize, though everyone must be familiar with the child who is brought along with nasal obstruction and discharge; the tonsils and adenoids are both enlarged, and probably palpable cervical glands are present. These tonsils and adenoids are removed and for a while the child improves; but the nasal obstruction persists in spite of breathing exercises and nasal therapy. Further investigation will probably reveal the presence of antrum infection.

Several observations can be made in the first place before the tonsils and adenoids are removed. The nasal mucous membrane is pale and sodden-looking and the turbinates are swollen, giving the appearance of complete blockage when looked at from the front; mucopus may be evident both in the nose and in the nasopharynx. The child is always "blowing its nose", and investigation of the handkerchief will show the typical yellow, caked appearance of pus. Transillumination is quite valuable, as light should come through a child's antra clearly, but a negative result is not necessarily conclusive. X ray examination comes under the same criticism.

If there is the slightest suspicion of antrum infection it is quite easy to "proof-puncture" the antra while the child is under the anæsthetic for the removal of the tonsils and adenoids. A small piece of gauze wrung out of a 1 in 1000 adrenaline hydrochloride solution can be packed under the inferior turbinates before the operation starts. When the canula is in position the child should be turned over and the face held downwards while a small quantity of lotion is pumped through the antrum and the return is examined for pus. If there is much present an intranasal opening should be made, the parents being warned beforehand that such a procedure may be necessary.

In cases in which the tonsils and adenoids do not require removal, or have been removed, all the evidence must be taken into consideration. If there is no doubt of the diagnosis and if a course of nasal hygiene has not improved the condition, intranasal antrostomy should be performed.

If a doubt exists, "proof-puncture" will clear it up. Local or general anæsthesia may be used, the choice depending on the age and disposition of the child. If local anæsthesia is used an injection of morphine half an hour before will assist materially.

The operation of intranasal antrostomy should be done with as little damage to the turbinates or nasal mucous membrane as is possible. First, a hollow punch is pushed through on a level with the nasal floor, then biting forceps enlarge the opening. Damage to the inferior turbinate makes adhesions probable, so rasping of any sort is contraindicated. If the opening is well made and low down it should drain naturally, and so frequent wash-outs are not required. If the discharge does not clear up quickly it does not generally clear up at all, and in that case a radical operation should be performed.

It used to be taught that children should not be subjected to this procedure, but the fact is that they come through the operation very well and the results are good. The idea that some of the permanent teeth may be destroyed is now found to be erroneous. Dr. G. A. D. McArthur has made an interesting report on the subject.

Maxillary Antrum Infection in Adults.

In adults the disease may be divided into two types, (*a*) acute and (*b*) subacute and chronic. In Melbourne, during the one hundred and third annual meeting of the British Medical Association, we heard it stated by one of the English visitors that intensive inhalation treatment accompanied by local heat would clear up any acute sinus condition. This seems a very dogmatic statement, and we were not told how long we were to leave patients with intense pain or external swelling under this treatment. Here, as elsewhere in the body, the surgical rule applies: pent-up pus must be set free. If this can be achieved by shrinking of the nasal membrane which allows drainage, well and good; but if not, other methods must be tried. Fortunately, in most acute cases the condition does subside with inhalations and cocaine packing; failing this, antrum lavage through a puncturing canula will be necessary. Frequently the mucosa is so swollen that nothing can be got through the normal ostium, but packing under the middle turbinate with cocaine and adrenaline may help; and blowing air through the syringe first may dislodge a piece of impacted mucopus. If one canula is not effective, then two should be tried, one acting as an outlet; and if even then nothing can be got through, an intranasal opening must be made. There is no need to make a large opening, as it does not matter if it closes up again after the infection has subsided; in fact there appears less likelihood of a cold's causing another flare-up if the antrum is shut off in its lower aspect.

The subacute and chronic cases are hard to differentiate, as one class runs imperceptibly into the other; and the acute stage, though always present, may not be violent enough to attract attention. Typically, the condition begins with a cold and the residual discharge of mucopus persists, accompanied by a varying degree of nasal obstruction and pain, or a feeling of heaviness in one or both sides of the face; toothache and neuralgia may also be present. On examination of the nose the membrane is seen to be engorged, and mucopus may be visible under the middle turbinate or in the inferior meatus.

The more insidious the onset, the more difficult the diagnosis, but we have certain aids to this if the disease is suspected.

Transillumination.

Transillumination is a great help if there is any inequality of translucency, though even if one side is definitely more dull than the other it is by no means conclusive. If both sides are dull the dulness may be caused by thick bone, but in combination with clinical evidence it is again suggestive. Complete double clearness on the other hand does not prove that no infection is present.

Radiological Examination.

Positive radiological findings are not conclusive; a thickened membrane may be due to past infection or to temporary swelling, and there may be pus in an antrum which gives a perfectly clear negative.

There is only one rule to follow: if the clinical evidence is in favour of antrum disease, then puncture the antra and wash them out. If no pus is present, then antrum infection can be excluded.

Some observers say that the presence of certain organisms in the fluid indicates infection; but it is almost impossible to avoid contamination, and we do not know that the normal healthy antrum does not contain organisms at times. In cases in which much pus is present in the nose, nasal lavage should be performed first, as the nasal pus may obscure the result of the antrum wash-out. Another school of rhinologists advocates removal of polypoid membrane even without the presence of pus; this is, of course, on radiological evidence, but I cannot believe that it is justified. I have seen several patients for whom this was done without relief of symptoms, and taking as examples three whom I have operated on myself, I may say that the membrane appeared perfectly normal and I did not feel justified in removing it. Here again I must refer to temporary swelling of the mucosa; in vasomotor rhinitis the nasal mucous membrane swells, so why not the antrum lining? The swelling of the nasal membrane will subside with appropriate treatment, so, again, the corollary.

Treatment.

Having decided that our patient has antrum infection we come now to the most controversial question of all: how are we to treat him? Some advocate intranasal antrostomy only; and here I think I can speak with authority, as I was introduced to our specialty in an intranasal school and have now swung entirely to the opposite way of thinking. The results I saw during that time were very bad in the chronic cases, and the ones I have seen since in practice are just the same. There is one argument in favour of the intranasal operation and that is that it does very little harm. If it is used as a possible preliminary to a radical operation then there is some excuse for it, but in the chronic case my experience of it is that it makes the patient more uncomfortable by allowing the discharge to go straight into the inferior meatus.

The advocates of the intranasal operation claim a high percentage of cures; but the answer is that most of those patients in whom the condition does clear up would have been cured without it, and the patients in whom the condition is chronic go elsewhere.

Repeated "proof-puncture" is the alternative to an intranasal operation, and it will effect the same result without damaging the nose. Various objections have been put forward to repeated "proof-puncture", and it is certainly not pleasant for the patient; but if it is done properly it is not very severe, and most patients prefer it to an operation. The objections raised are, first, that it is painful, particularly if the bone is hard. I remember a well-known European rhinologist saying "If you have to push

hard you are in the wrong place"; my experience is that this is true. It does not follow that you can always find the right place, owing to nasal deformities or to abnormal inferior turbinates; but if there is a doubt a diathermy needle applied to the site of puncture beforehand is most helpful. Sometimes putting the applicator in position is painful; in these cases careful packing with cocaine-soaked wool swabs will be just as effective if time and trouble are taken and if the trocar used is a fine sharp one, not one of the huge things which are sometimes seen. After each puncture the next one should be easier, as there is more probability of striking a previous spot.

Hæmorrhage is another objection, but this is never severe; if it is annoying, then again the diathermy needle applied to the site before puncture will minimize it.

Then comes the question of how long "proof-puncture" of an antrum is to be continued; that is difficult to answer, and depends on a number of points. The first of these is the type of pus; if there is much mucus present, indicating at least that some of the cells are active, then "proof-puncture" is worth going on with, the general rule being to continue while there is any improvement. It is surprising how in some the condition will clear up with perseverance. I had one case in which this was proved.

I washed out one antrum six times without any sign of improvement, and then suggested radical operation; the patient said she would sooner continue. The antrum was clear at the thirty-second wash-out and the infection has not recurred.

If the pus is of the foul, necrotic type, and if it does not decrease after the first few punctures it is seldom of much use continuing, the mucous cells having ceased to function and the antrum lining having become polypoid and necrotic. A lot depends on the attitude of the patients; and the position must be put to them clearly that even if they go on having punctures they may still have to have an operation later. The procedure, however, is definitely worth trying.

If it is found that the radical operation has to be performed, then the antrum must be cleaned out thoroughly. If I may again refer to the one hundred and third annual meeting of the British Medical Association of 1935, I remember that it was said that "only the diseased portions of the membrane should be removed". I should like to know how we are to tell which are diseased and which are not. I have found from experience that the patients who have had their antra completely cleared and in whom the bone is white and shiny are the ones that do best. For this reason a bloodless field at the end of the operation is most important, so it is a good thing to pack the antrum with some coagulating substance when it appears to have been cleaned out thoroughly. It is amazing how often little bits of membrane are still found to be present. It is always as well to break through the posterior ethmoidal cells into the nose and to pull a piece of gauze backward and forward through this opening, as the cells in this region are almost invariably infected. I find that except in the rarest cases it is unnecessary to pack the antrum. If the buccal incision is sutured and if the nose is carefully packed, no serious bleeding will take place, and the swelling of the face, so common after radical antrum operations, is then almost negligible.

As to after-treatment, I find that the less the antrum is washed out the better. One wash-out is required to clean out the blood clot, but that is frequently all that is needed. Constant washing, when there is nothing to remove, can be only harmful. If the nasal opening has been made correctly and if the patient has been taught to blow his nose properly his antrum will drain itself of mucopus. Sometimes after a cold the opening may become blocked and require a wash-out at a later date.

A large number of my colleagues will not agree with all I have said, some of them with none of it; but I feel that the members of the profession outside our specialty are rather in the dark over antrum treatment, and any statement of definite policy, even if it arouses more controversy, should clear their minds.

Bibliography.

G. A. D. McArthur: "The Results of Radical Antrum Operations in Children", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, 1937, page 470.

Reports of Cases.

A CASE OF NEUROFIBROMA (VON RECKLINGHAUSEN'S DISEASE).

By A. E. COATES,

Surgeon to In-Patients, Royal Melbourne Hospital.

THE following case is of sufficient rarity to warrant recording.

Mr. H. W., referred by Dr. Alan Millikan, of Casterton, complained of a lump hanging from the buttock. The lump had been present as a small mole in infancy and early life and had continued to grow over the years until, when the patient reached the age of fifty-six years, it had attained the enormous dimensions shown in the illustrations. The inconvenience, especially in defæcation, and the fact that he was becoming aware of a stoop owing to the weight, had induced him to consult his doctor. He stated that the mass was increasing in size of recent years, and it caused trouble about the anus. He was unable to clean the anal region.

On examination of the patient an apron-like mass was found suspended from the buttocks. It was 35 centimetres (14 inches) wide at the base. Its surface was mottled and striated, and the skin covering it was pigmented and studded with tiny lumps. The same condition of the skin was found in the back up to the level of the lumbo-sacral articulation.

A diagnosis of *molluscum fibrosum* was made, and at the request of the patient the mass was removed. Under general ether anæsthesia the mass was excised and the loose flaps of œdematous skin were sutured. Drainage was provided at each end of the transverse wound. Healing occurred slowly and the patient was discharged from hospital in six weeks. Unfortunately he developed a severe degree of œdema of the legs, abdomen and upper limbs while he was in a convalescent home, and he was returned to hospital. The buttock wound then broke down. After careful medication, supervised by Dr. Leslie Hurley, he recovered and the buttock wound slowly healed by granulation. Physiotherapy, including light treatment, by Dr. Frank May accelerated healing, and he was discharged from hospital, healed, after seven months of recumbency. He is now quite well.

The tumour weighed 5·4 kilograms (twelve pounds). Its cut surface was œdematous and white, marked here and

there by large cavernous blood spaces. Some cavities, 2·5 centimetres (one inch) wide were filled with clear fluid. The consistency of the bulk of the white tissue was that of leather.

The pathological report on a microscopic section, by Dr. Eric Cooper, was as follows:

> A mass of tissue consisting of fibres with very few cell nuclei. Blood vessels thick-walled. Tumour covered by squamous epithelium with very few glands and no fat. Neurofibroma, of inactive type; nothing in section to suggest activity.

The anatomical site of the tumour suggests that it was confined to the area supplied by the posterior rami of the lower lumbar and upper sacral segments (probably

FIGURE I.

the fourth and fifth lumbar segments and the first and perhaps second sacral segments). It was impossible to determine exactly the segmental origin of the mass because of the stretching of the skin which had occurred. The anterior divisions of the above-mentioned segments were obviously not involved. The skin of the lower extremities was normal. The complete removal of all affected skin was not possible, but the excision of the main dependent mass has relieved the patient completely.

The ultimate fate of the cut tumour tissue is in doubt. The possibility of active growth supervening on interference must be borne in mind; but there is no evidence of this complication one year after the operation.

NOTE ON A CASE OF FORENSIC INTEREST.

By G. M. HARRIS,
Streaky Bay, South Australia.

PENETRATING wounds of the superior *vena cava* must be extremely rare, and for this reason I am reporting the following case.

The facts elicited in the Central Criminal Court, Adelaide, were the following. On July 9, 1937, a farmer was stabbed by his father in a wheat field. His father's statement was as follows:

> I thought I had only caught his clothes. I said: "I will give it to you." He said: "You have already stabbed me", and went over to the fence (about ten feet away). He got through the fence and staggered about in the road. I went to his assistance when I could see him staggering. My son and daughter came down, but he was lying on his back then, and I thought he was beyond aid.

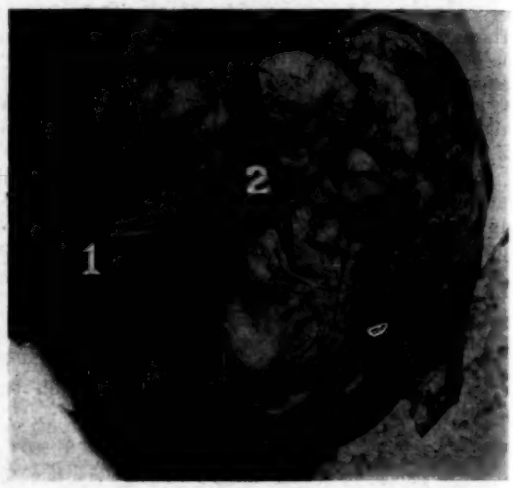

FIGURE I.

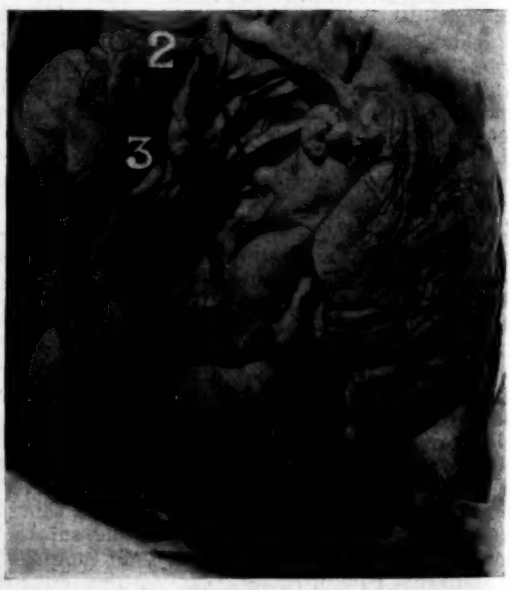

FIGURE II.

It was shown in court that after being stabbed the man had made his way through a fence, had spoken one sentence and had walked thirty yards.

The *post mortem* examination, which I conducted, revealed a wound 1·25 centimetres (half an inch) long in

the superior *vena cava*, in the intrapericardial part of its course.

The illustrations show the wound in the upper lobe of the right lung (Figure I, 1), the wound in the pericardium (Figure II, 2) and the wound in the superior *vena cava* (Figures II and III, 3).

FIGURE III.

I am very surprised that such a wound did not cause immediate loss of consciousness from failure of the blood supply to the brain, as over a litre of blood was present in the right pleural cavity.

TUBEROSE SCLEROSIS OR EPILOIA: THREE CASES IN ONE FAMILY.

By S. EVAN JONES, M.B., B.S.,
Medical Superintendent, Broughton Hall Psychiatric Clinic,

AND

GUY P. U. PRIOR, M.R.C.S., L.R.C.P.,
Sydney.

THE unusual occurrence of epiloia in three members of one family, to date the whole family, is worthy of record. The children came under observation because of epileptiform symptoms; muscular twitchings and "turns" were their chief symptoms in common. The family consists of Dora, aged five years, whose first symptoms appeared at six months; Jane, aged two and a half years, whose first symptoms appeared at six months; Keith, aged five months, whose first symptoms appeared at four months.

Dora, at the age of six months, had attacks of twitching of the right foot and hand. She now has attacks which begin with twitching of the right foot; this twitching extends to the right leg and right arm; a convulsion limited to the right side ensues. She does not lose consciousness; sometimes she falls, and she has bitten her tongue and has passed urine in an attack. She has an aura. She feels a sensation that she cannot describe; but she is able to tell her mother when the attack is coming. She has from one to six of these daily. She is a bright child of normal intelligence, has a faint but definite butterfly *adenoma sebaceum* across the nose and cheeks, patches of leucoderma upon the body, and a "shagreen patch" over the sacrum. In standing she sways backwards and forwards, and there are constant irregular movements of the shoulders. The right leg is smaller than the left. In walking she throws the left leg forward and the knees are kept rather bent. She step-dances, during which it is seen that the action of the left leg is much greater than that of the right. She walks on the inner sides of both feet, to correct which her shoes are specially constructed. Romberg's sign is present, the eye movements and pupil reflexes are normal. Facial, jaw and abdominal reflexes are absent. The knee jerks are diminished; the plantar reflexes are sluggish and flexor. An encephalographic examination was made in 1935, the report being as follows: ". . . appearance suggested presence of old inflammatory areas."

Jane, the second child, is an imbecile. She cannot walk or talk, and her habits are faulty. She will make an attempt to walk if held by the right hand, but not if held by the left. Jane has "turns" in which the eyes turn downwards; she then twitches all over and becomes rigid; the left side is more affected than the right. Knee and ankle reflexes are absent; both plantar reflexes are present, the left extensor, the right flexor in type. This child has patches of leucoderma about the body, but no *adenoma sebaceum*, which is said not to appear until about the fifth year.[1]

Keith, at two and a half months of age, had attacks in which there was twitching of the facial muscles; later these extended to the arms and legs, which, after twitching, would become rigid. He is stated to be conscious through the attack.

The father, who appears a man of normal physical and mental development, has an adenomatous rash around each side of the mouth. The father's sister has leucoderma. A mother's cousin is mentally deficient. The mother states that all confinements were easy and normal, and all the children were healthy at birth. The blood serum of neither parent reacts to the Wassermann test.

All three of these children have leucoderma on unexposed parts of their bodies. The mother says that in each case this occurred at a very early age, but only after the child had been exposed to the sun and when the bronzing that resulted was fading.

Comment.

Tuberose sclerosis has been defined as "a rare congenital disease characterized by sclerotic masses in the cerebral cortex, *adenoma sebaceum*, tumours in various organs, by mental deficiency and epilepsy".[1] The convulsions usually begin during the first year of life, and the attacks may be *petit mal*, major or Jacksonian in type. In addition to *adenoma sebaceum*, other dermatological changes have been noticed. MacDonald Critchley and C. J. C. Earl describe these lesions as "shagreen patch", an uneven thickening of the skin, rising above the surrounding surface, usually single and found in the lumbo-sacral region. There are a diffuse bronzing of wide areas of skin and oval or circular areas of brown pigment, known as *café au lait* patches, and sometimes of abnormal whiteness. Critchley and Earl say that the diffuse bronzing is the more common of these lesions.[2] Brain gives the ætiology as "a congenital abnormality, probably occurring in an early stage of embryonic life". He says that two or more siblings may be affected, that most patients die between the ages of five and fifteen years, though some may survive to between thirty and forty years of age.[3] Critchley and Earl, in 13 cases out of 20, record a family history of *adenoma sebaceum*, psychosis, epilepsy or alcoholism. They mention a family in which father, daughter and grandfather were affected.[2]

References.

(1) W. Russell Brain: "Diseases of the Nervous System", 1933, page 486.

(2) MacDonald Critchley and C. J. C. Earl: "Tuberose Sclerosis and Allied Conditions", *Brain*, Volume LV, Part III, September, 1932, page 311.

Reviews.

CHEMICAL TESTS FOR THE CLINICIAN.

THE same care and sound judgement as distinguish the first edition of Harrison's "Chemical Methods in Clinical Medicine" have been exercised in the revision of this excellent book.[1] The second edition will be welcomed by all workers in the field which it covers. Although the book has been increased only by some fifty pages, there is proportionately a much greater increase in the material considered. The index is about 50% larger than it was before. This result has been achieved partly by slight alterations of typography, but mainly by the author's firmness in excluding methods and curtailing discussions in the light of experience gained during the seven years which have elapsed since the first appearance of the book. A judicious use of heavy faced type for headings has made the subsections more readily available for reference.

There are, of course, one or two surprises with regard to what has been excluded and what retained. Folin's method for the determination of non-protein in blood has been omitted, while the more complex Pregl method is retained. It is true that the original Folin method had certain disadvantages, but these have been completely overcome in the Koch-McMeekin modification, which has been available for a number of years. The author has, perhaps, been influenced in this matter by the antipathy to colorimetric methods which is so common in English laboratories. The limitations of these methods are well known to all competent users of them. In his discussion of them the author writes: "In spite of these limitations, however, colorimetric methods are valuable, and particularly in chemical pathology on account of their relative simplicity and the speed with which repeated estimations of the same substance can be performed. Moreover, colorimetric methods are often applicable to much smaller quantities of fluid (for example, blood) than the more orthodox volumetric or gravimetric methods. Indeed, in medicine it may be a question of a colorimetric method or none at all." In the circumstances it would seem well to make a virtue of what is becoming daily more of a necessity. Incidentally, it may be noted that some of the volumetric and gravimetric methods employed in clinical biochemistry are anything but orthodox.

A disappointing survival in the book is the Esbach method (with its more pretentious relative, the Aufrecht method) for the determination of protein in urine. This method has the sanction of long usage, but comparative tests show that it is subject to gross errors. Indeed, an ironical French critic has claimed that it is capable of giving negative values for the protein content of urine. The retention of these methods is the more surprising as very simple turbimetric methods are available for these determinations, and a simple and elegant colorimetric method has recently been published from the author's own laboratory at Saint Bartholomew's Hospital.

The extension of the section on urinary deposits fills what was a noticeable gap in the first edition. The much fuller treatment of the examination of blood for abnormal pigment will be appreciated in view of the introduction of sulphanilamide and related compounds as antiseptics, and their occasional toxic effects accompanied by the formation of sulphæmoglobin and methæmoglobin.

Curiously enough no methods for the determination of hæmoglobin in blood are described. Although these determinations are usually made by the hæmatologist, there are essentially biochemical procedures.

The author retains his very conservative estimate of the clinical value of the fractional test meal. He adheres to his opinion that examination of the fasting stomach contents gives practically as much information in routine tests, and that the fractional meal should be reserved for special tests or for research. While all may not share this opinion, all must respect it who recognize the care with which the author forms his opinions and the restraint with which he expresses them. Indeed, one gets the impression that although Saint Bartholomew's may not have the best facilities for biochemical work among English hospitals, few are likely to be better served in this department.

This book should be in every pathological laboratory. The discussions on the interpretations of the various tests should be studied as carefully by the clinicians who would make use of the tests as by the laboratory workers who must apply them.

[1] "Chemical Methods in Clinical Medicine: Their Application and Interpretation, with the Technique of the Simple Tests", by G. A. Harrison, B.A., M.D., B.Ch., M.R.C.S., L.R.C.P.; Second Edition; 1937. London: J. and A. Churchill Limited. Medium 8vo, pp. 596, with 3 colour plates and 86 illustrations. Price: 21s. net.

POLITICS AND PUERPERAL FEVER.

WE are indebted to Robert Allerton Parker for a vivid translation of two original and striking essays by a modern French author, Louis-Ferdinand Céline. They are incorporated in a volume of 175 pages under the double title, "Mea Culpa, and the Life and Work of Semmelweis".[1] The first is a savage diatribe in the Parisian vernacular against the political machine that controls the destiny of the masses in Soviet Russia. The real meaning of the tirade is obscured by queer phrases and unsavoury invective; but on contemplation the reader gains the impression that the author has formed a most degraded opinion of the genus *Homo sapiens*, and can see no virtue in its efforts to improve society.

What relationship, if any, exists between the lurid curtain-raiser which so heartily condemns man's inherent stupidity and hypocrisy, and the dramatic story of Ignaz Philipp Semmelweis, is a problem for the reader to solve. Nevertheless, every obstetrician should read this enthralling narrative of a martyred soul relentlessly and fearlessly pressing forward in the pursuit of an ideal; bruised, battered and at last completely overwhelmed in conflict with the traditional attitude of the medical world of his day. Céline gives a full account of the Hungarian doctor's chequered career, many details of which are omitted from the majority of books on medical history. He brings one chapter to a close with this interesting observation: "Semmelweis hurled himself against obstacles which, there is little doubt, the rest of us might have overcome by the exercise of simple prudence and elementary tact. He lacked, or neglected, it seems, that indispensable respect for the futile conventions of his epoch, of all epochs in fact, without which stupidity becomes an uncontrollable force. From the human point of view, he lacked tact." There is more to be gleaned from the moral of this pathetic tale than from the mere statement of historical facts.

The spelling of "dilettante" on page 112 and the date "1884" on page 76 are evident misprints.

[1] "Mea Culpa, and the Life and Work of Semmelweis", by Louis-Ferdinand Céline, translated by R. A. Parker; 1937. London: George Allen and Unwin Limited. Crown 8vo, pp. 175. Price: 5s. net.

The Medical Journal of Australia

SATURDAY, MAY 14, 1938.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

NATIONAL HEALTH INSURANCE IN AUSTRALIA.

For some considerable time it has been the declared intention of the Commonwealth Government to introduce into Australia some form of national health insurance. What the form was likely to be was indicated when Sir Walter Kinnear first visited Australia at the invitation of the Commonwealth Government and made his report. The Government made it quite clear that, in order to ensure the smooth working of the scheme, it would seek the cooperation of the medical profession. Obviously the profession had to formulate its ideas and be prepared not only to state the terms under which it would accept service, and to give substantial reasons for having adopted them, but also to do its utmost towards the securing of an adequate service to the public. Those who have followed the reports of the meetings of the Federal Council of the British Medical Association in Australia, published from time to time in this journal, will know that much time and much thought have been given to this subject. It was for this very reason that the Federal Council at its last meeting appointed an executive committee; and this committee has recently been in conference with representatives of the Federal Government. A brief statement regarding the decisions reached at this conference has already appeared in this journal (issue of April 16, 1938); but until now it has not been possible to make known to the profession through this journal the reasons that actuated the Federal executive in coming to these decisions. This is a fact that we regret. The Federal Government was, of course, under no obligation to consult the medical profession, though it showed its wisdom in doing so. When, therefore, the Government asked the members of the Federal Council executive to refrain from making the information public, the request had to be honoured.

The principal decisions reached at the conference had to do with the terms of service of the medical profession. It was decided: (i) That the capitation fee for a general practitioner service, excluding treatment in respect of a confinement and treatment of an insured person who becomes entitled to the benefits of any Commonwealth or State *Workers' Compensation Act* or *Seamen's Compensation Act*, and excluding major operations and administration of anæsthetics (requiring the presence of another practitioner), be eleven shillings. (ii) That the rate of payment for the administration of an anæsthetic to an insured person, unless the administration is in itself a specialist service, be one guinea. (iii) That when it is required to administer an anæsthetic to an insured person, the insurance practitioner on whose list the insured person is placed, shall within ten days notify the local officers of the commission of the fact. (iv) That mileage be payable at the rate of two shillings a mile one way beyond three miles, but that in areas presenting special travelling difficulties the rate be increased and that the question be reviewed in five years.

The capitation fee was determined by consideration of the remuneration at present being paid for contract practice in all the States of Australia. The average rate of payment in metropolitan areas is 25s. and in country areas 30s., the weighted average being 27s. However, in view of the dissatisfaction which has existed in Victoria in regard to the capitation rate for contract practice, it was

decided that the standard of payment for these purposes should be that existing in New South Wales, namely, 26s. in the metropolitan area and 32s. in the country — an average of 29s. Each friendly society lodge member on a medical practitioner's list obviously represents more than one person receiving attendance; and it became necessary to determine this figure. Apparently the only reliable statistics regarding dependants are those of the Government Actuary in Victoria, who states in his valuation report of the friendly societies that each lodge member (he includes unmarried members) represents 3·2 persons. Therefore, dividing 29s. by 3·2, we have the figure of 9s 0¾d. as being the amount actually being received at the present time by medical practitioners for the treatment of each individual entitled to lodge benefits. The friendly society system of contract practice is not an "all-in" service, in that certain extras have to be paid for by the lodge member. In other words, it was necessary to discover how much would have to be added to the 9s. to provide remuneration suitable for the service to be given under the proposed scheme of national insurance. The only figures available as to the amount received by medical practitioners by way of extras were those obtained by the New South Wales Branch from a *questionnaire* submitted to its members last year. The amount received from each lodge member was 9s. 6d., so that the average received from each person entitled to lodge benefits was 3s. This gave as a capitation rate for a complete service (excluding treatment in respect of a confinement and treatment of an "injured worker" lodge member entitled to the benefits of the *Workers' Compensation Act*) the amount of 12s. After the matter had been debated at length it was decided to exclude anæsthesia from the medical benefits and to make the capitation fee 11s. It has been claimed that friendly society members represent selected risks, and that therefore an amount should be added to the capitation rate. In opposition to this view it is pointed out that no person will be insured who is not employable, and that no insured person will be entitled to medical benefits until he has been insured for three months. Moreover, the average age of friendly society members is 41·9 years, and it is computed that the average age of those who will be insured will be 31·5 years, the latter age regarded as having a sickness rate 30% less than the former.

The mileage rate was determined by the estimation of the complete running cost of a motor car (this worked out at sixpence a mile), and by estimating the cost of a medical practitioner's time while he was driving at twenty-five miles an hour. It was assumed that the average income of a practitioner was £1,500 a year, and that he worked for fifty weeks during the year and for forty-eight hours a week; this makes his remuneration 12s. 6d. an hour. In the estimation of the mileage the distance of every patient's residence from the doctor's surgery will be recorded on the medical card of the insured person, and for that person one or more units will be allotted to the practitioner according to the distance of the patient's residence from the doctor's surgery. The practitioner will be paid quarterly according to the number of units disclosed by the patients' cards. He will be paid mileage for each patient whether he has visited the patient or not, and it has been calculated that one visit will be paid to each patient every year.

It is to be noted that the scheme covers all persons who are under contract of service and who receive an income up to £365 *per annum*. No income limit has been fixed for manual workers, for the reason that, while their hourly rate of pay may exceed £365 *per annum*, their aggregate annual income in the greater majority of cases does not exceed the income limit of £365; these persons will thus not "slip in and out" of insurance. It is further to be noted that the scope of the scheme covers general practitioner treatment, including all proper and necessary medical services, other than treatment in respect of a confinement, other than workers' compensation treatment, other than the administration of an anæsthetic when such administration requires the presence of another practitioner, and other than treatment involving the application of special skill and experience of a degree or kind which general practitioners as a class cannot be reasonably expected to possess.

The conditions of service that have been set out have been accepted by the executive committee of the Federal Council as reasonable in view of conditions of contract practice obtaining in Australia at the present time. Some practitioners may think that the terms of service are not what they should be; if there are any such persons, they must remember that claims for remuneration in a matter of this kind must be justifiable. On available data it would be extremely difficult to justify claims for better conditions, except perhaps in one or two minor points. The Federal Council has done its duty to the community and to the profession which it represents. For years the medical profession has been telling governments that it has the welfare of the community at heart, and that its objective is the provision of a proper medical service for the people. Thus when the Federal Government brought forward its scheme of national insurance and asked for the cooperation of the medical profession, cooperation was gladly given. Whether the scheme is ever put into practice remains to be seen; but if it does come to nothing, no one will be able to say with truth that the medical profession did anything but try to assist in its inauguration.

Agreement to cooperate in the proposed scheme of national insurance does not preclude criticism of the scheme. No one will agree that the scheme is ideal. It is far from ideal; for while it does allow the insured person the choice of his medical attendant, it makes no provision for the dependants of insured persons. Indeed, if the scheme as drafted becomes effective it may be that many of the dependants will be deprived of medical benefits that they receive at present through the friendly societies, because the breadwinner may not be able to make voluntary contributions to a friendly society as well as compulsory contributions to national insurance. However, it is believed that the friendly societies will seek the cooperation of the profession with the object of providing some machinery by which insured persons will be able to make provision for their dependants; and for this reason alone we believe that the friendly societies have strong claims for recognition as the sole approved societies. Another fault in the scheme is that it does not include the unemployed and the unemployable—the people who need medical care the most and are least able to afford it. Further, no provision is made for specialist services.

However, failure of the Government to provide a complete scheme is not an indication that the scheme should be rejected. There is reason to hope that although it is launched in what may be termed a primitive form it will develop later into a complete organization, worthy of the Commonwealth and its people. Every nation striving for strength and prosperity will do what it can to secure the health and well-being of its individuals; Australia as a nation cannot afford to be anything but careful of the physical perfection of its people. Finally, medical practitioners who cannot see the writing on the wall, who would at any cost stick to the good old days, as they call them, would do well to remember that national health insurance is the best possible preventive of nationalization of the medical profession—a process which can only be described as detrimental to the welfare of the community, likely to be destructive of progress in medical science and fatal to the freedom of the medical practitioner.

Current Comment.

LESIONS OF THE SEBACEOUS GLANDS.

W. R. JAFFREY has recently reviewed the various disorders of the sebaceous glands.[1] He observes that there are three types of these glands. Some are appendages of the hair and its follicle. Others are associated with the lanugo hairs and open directly on the cutaneous surface. The remainder are unconnected with other structures and either open directly on the skin surface or are situated at the mucous orifices. Among the latter are the *glandulæ odoriferæ* of the genitalia. They are halocrine glands, and the fatty material originating in the cuboidal cells which line the acini is exuded from these cells as they are pushed out of the duct. The quantity of oily matter excreted is an individual peculiarity and is probably hereditary. The control apparently lies in the endocrine chain balance. A suggestion has been made that the substance which stimulates the skin glands in pregnancy, in particular the glands of the breast, also stirs to action the fœtal sebaceous glands, and *vernix caseosa* results. This stimulus is absent after birth, and the sebaceous glands are then inactive, excepting in rare instances, and never after five years of age,

[1] *The Canadian Medical Association Journal*, January, 1938.

up to which time scalp seborrhœa does occur in infants. At puberty the tendency reappears, and reactivity of the sebaceous glands has been noted in senility. Mammary gland activity may produce an internal secretion which throws off the balance of sebaceous secretion, and the suggestion that such dairy products in the diet as milk, cream, butter and cheese may be connected with the development of acne may be well founded. Endocrines from the mammary gland of the cow may cause over-activity of the human sebaceous glands. In addition to neoplasms, the most diverse disturbances of these glands are seen in asteatosis or xerosis, with deficiency of sebaceous secretion; in xeroderma, where the glands are almost absent; and in *seborrhœa oleosa*, where the glands are abundant and over-active. In addition to under-secretion and over-secretion, the sebaceous glands are subject to sluggish mechanism, parasitic involvement, bacterial infection and to pathological conditions associated with vascular changes. Jaffrey states that sluggishness, bacterial infection and congestive changes are all intimately associated with endocrine disorders. These manifestations are rarely observed in hyperthyreoid but are common in hypothyreoid states. They are associated with hypoacidity and sugar intolerance. The exhibition of iodine may initiate inflammatory changes around the sebaceous glands, or it may exacerbate an existing acne. Probably this results from irritation by the halogen of the glandular structure. This may be indirect and due to an action on the sympathetic nervous system, or it may be a direct effect on some member of the endocrine chain. Excretion of the iodine by the gland may be an important factor. Sluggishness of the glands favouring congestion and bacterial invasion is observed during the period of gonadal activity and is due directly to a depressor or excitor action on the sebaceous gland. Jaffrey considers it possible that the sebaceous gland has an internal as well as an external secretion. He believes that the reaction in *acne rosacea* is vascular in character, but that it is the sebaceous gland that is affected. He points out that an age incidence exists in this disease, which occurs in the age period of thirty-five to forty years, when there is another cycle occurring in the gonads and of the opposite character to that of puberty.

The author gives a detailed account of the various disorders of the sebaceous glands. Of seborrhœic dermatitis he says that it arises from a seborrhœa on which inflammation is implanted. The microscopic picture closely resembles that of psoriasis, but the pegs are flatter and the infiltrate is more lymphocytic. The cause is infective. The organism has various designations, including *Pityrosporum ovale* or Unna's "bottle bacillus". It finds its correct medium in the seborrhœal secretion favoured by an enzyme or suitable acid-base reaction. Jaffrey, however, considers that cultural and inoculation experiments are not quite conclusive, since "takes" are obtained but do not persist like the disease itself. In view of recent discussions concerning the nature of sebaceous cysts, it is interesting to note the author's view that "steatomata, or wens, or sebaceous cysts, are sebaceous material in a fibrous capsule, or retention cysts, and probably dermoids from embryonic remnants in the skin. They have a familial incidence and are usually beneath the epidermis." Knowing the rebellious nature and disfiguring aspect of acne, the physician will be interested to learn that, whereas its usual incidence is between the ages of twelve and twenty years, acne also occurs in very young infants, most of whom are males. This infantile type is almost exclusively limited to breast-fed infants. *Comedones* may be seen in very old persons. Acne patients usually have a poor sugar tolerance, are hypothyreoid in type, and are subject to frequent gonadal disturbances. Jaffrey maintains that the halogens cause follicular eruptions for a twofold reason—the rich blood supply round the follicles and the secretion or excretion of the halogens through the sebaceous glands, for which they have a specially injurious affinity. Halogen influence is encountered in *acne vulgaris* and *acne rosacea* when the affected persons ingest iodized salt, which has about ten times the concentration of iodine required to prevent the development of goitre. Even the external application of the halogens disturbs the sebaceous glands. This influence may be observed in the chloracne which affects certain workers in industry.

Certain observations on *acne rosacea* conclude an interesting paper. The chief clinical disturbances found in this disorder are mental irritability and perverted fatigue, indigeston associated with hypoacidity, disturbance of the gall-bladder, uterine dysfunction and a hypothyreoid state. The author would also include chronic appendicitis, but surely his imagination has here run riot. In his remarks on the treatment of rosacea he states that it has been found that if one side of the face be subjected to X ray therapy, both sides improve alike. This observation suggests that the effect of the rays is not solely local. The reader will be loath to accept all of Jaffrey's conclusions.

URTICARIA.

THE community in general is thoroughly familiar with urticaria under the popular designations of "hives" and "nettle rash". The precise manifestation of urticaria varies greatly and subdivisions of the disorder are accordingly recognized. Different factors have been assigned as causative agents. They may be direct external irritants, of which the Portuguese man-of-war, a troublesome visitor to the surfing beaches, is an example, or the irritation may be indirect and result from certain drugs or foods. The majority of the populace are afflicted sooner or later with the disorder. The causative agent is generally known, but in other cases it may completely elude detection.

In an interesting paper Harold Orr observes that the urticarial lesion is identical with Sir Thomas

Lewis's experimental reaction, "the triple response".[1] When normal skin is firmly stroked, various phenomena occur within a few seconds. There is a local dilatation of the capillaries, resulting in an erythema which is confined to the line of the stroke and is independent of innervation. A minute later there is a more diffuse response due to relaxation of the arterioles around the line of the stroke and appearing as a wide flush or "flare". This originates through a local nervous reflex. In some persons these manifestations are followed by œdema or "whealing", the result of increased permeability of the vascular walls. Such a condition is known as dermographism or factitious urticaria. As Orr reminds us, Lewis has shown that the triple response is due to a diffusible substance (probably histamine) derived from damaged epidermal cells. If a drop of diluted histamine is placed on the skin and a prick made through it, a triple response will result. Orr informs us that the histamine content of the epidermis is 24 milligrammes per kilogram. This is equal to a solution of 1 in 40,000, which may cause a flare and a wheal if pricked into the skin. Injured skin has the same quantity of histamine as the normal skin, but the concentration soon becomes less owing to absorption of the compound into the blood stream. If the quantity thus absorbed is adequate, there will occur a systemic reaction identical with the first stage of the triple response. This reaction includes a general capillary dilatation with marked fall of blood pressure and manifestations of shock. Sometimes urticaria and symptoms of shock coexist, as in the experimental production of anaphylaxis. This reaction has been demonstrated to be due to interaction of antigen and cell-fixed antibody. The interaction injures the cells to which the antibody is fixed, and histamine or an allied substance is liberated. In a sensitized person a local urticarial response may often be evoked by pricking the antigen into the skin, the result being identical with that caused by the pricking of histamine. Orr considers that most of the cases of urticaria are probably caused by H-substance liberated from the epidermal cells by interaction of antigen and antibody. In many cases H-substance is liberated from cells damaged by other agents, such as trauma, heat, cold, insect bites, plant and chemical irritants, and ultra-violet and other short-wave radiations. Any injury to the epidermal cells which results in the liberation of the diffusible histamine-like substances may provoke the occurrence of urticaria.

The epidermal cells are not the only ones to which antibody becomes fixed. Orr believes it likely that the cells primarily affected are those in the superficial portion of the dermis. With an antigen to which an individual is known to be sensitive, the reaction cannot be caused by placing it upon the surface of the skin, as in the patch test. It is necessary that it be introduced into the skin so that it may come in contact with living cells in the deeper part of the epidermis or with the cells around the minute vessels of the cutis. In most instances of urticaria, therefore, the antigen reaches the skin from within. With a known antigen the Prausnitz-Kuestner reaction is positive. Orr states that most of our knowledge of antigen-antibody interaction is based on this reaction. The test is made by injecting into the skin of a normal subject a series of dilutions of serum from an allergic individual, and, as a control, a series of corresponding dilutions of serum from a normal person, the two lines of injection being parallel. Twenty-four hours later the antigen is injected into all the sites. The result is a "positive" reaction in the one line and a "negative" in the normal control. When the antigen is injected at some distance from the site of the serum injection the reaction occurs just as before at the site of the serum injection only. This phenomenon proves that only traces of antigen are necessary and that the antibody remains cell-fixed at the injection site. Orr states further that if in a case of food allergy the "positive" serum is injected into the skin of a normal person, a wheal will form at the site of the injection within two hours of the consumption of the specific food. One wheal desensitizes the site, the antibody being neutralized in the interaction with antigen. If antigen is absent, the site will remain sensitive for several weeks and the cell-fixed antibody will disappear very slowly. Heat and cold are not common causes of urticaria. It has, however, been pointed out that collapse of a swimmer is the most dangerous consequence of hypersensitiveness to cold. Cold causes an increase of permeability of the tissue cells and allows diffusion of the histamine-like substance. When there is a sufficient concentration in the general circulation, shock symptoms occur. If this concentration occurs in the blood of a person who is swimming, death is inevitable unless an immediate rescue is effected. Systemic desensitization of a person to cold can be brought about by directing the patient to immerse his hand in ice water for two minutes twice daily for a month. Desensitization to cold can also be effected by the injection of 0·1 milligramme of histamine twice daily for two or three weeks.

Acetylcholine may cause capillary dilatation. It is liberated by the parasympathetic nerves at the periphery of the body. Its sudden appearance is considered by Orr to be an occasional cause of neurogenic urticaria. It is well known that emotional stress may precipitate the occurrence of urticaria. Orr points out, however, that the emotion of anger causes by stimulation of the sympathetic nerves the liberation of adrenaline, which is antagonistic to acetylcholine. It is consequently difficult to give an adequate explanation of the occurrence of urticaria after a display of this emotion.

It is known that protein may pass unaltered through the intestinal villi. Intracutaneous tests with the offending protein may yield "positive" reactions and yet the patient may be sensitized, not to the whole protein, but to a product of its digestion. These matters and many others are thoroughly discussed by the author.

[1] *The Canadian Medical Association Journal*, February, 1938.

Abstracts from Current Medical Literature.

PÆDIATRICS.

Splenectomy in Childhood.

LOUIS K. DIAMOND (*The American Journal of Surgery*, February, 1938) describes the types of abnormalities for which splenectomy is believed to be indicated in childhood, and the further growth and development of children whose spleens have been removed during the past ten years. The five diseases mentioned, in which splenectomy is indicated, are congenital hæmolytic anæmia, splenic anæmia, splenomegaly with gastric hæmorrhage, *purpura hæmorrhagica*, and Gaucher's splenomegaly. In the author's series there were fifty-two splenectomies with two deaths due to operation, a mortality of 3·8%. In the congenital hæmolytic anæmia group splenectomy was performed upon twenty children. Emphasis is placed upon the greater severity of the disease in childhood, on the need for early operative treatment to prevent fatal termination, and on some of the unusual manifestations of the disease which may be seen. Of these, mention is made of cardiac enlargement with valvular insufficiency and cardiac decompensation. Also the growth of the skeletal structures may be affected. Not only is the stature small, but the formation of centres of ossification is delayed. In addition, the bones tend to become wide, but have a thin cortex, the result of the hypertrophy of the marrow tissue in its effort to keep up maximum erythrocyte production. The author states that results of splenectomy in this disease were most gratifying. Eighteen of the twenty patients were relieved of all symptoms. There was a particularly striking improvement in growth and development. In the splenic anæmia group the results of splenectomy were in general fairly good, although not so satisfactory as in congenital hæmolytic anæmia. Splenomegaly with gastric hæmorrhage is another fairly well defined symptom complex occurring in children which has been confused with Banti's disease in the past, but which should be sharply differentiated therefrom. The onset is a sudden unexpected hæmatemesis in a child who has apparently been in good health previously. The blood, however, is normal in its content of red blood cells, hæmoglobin, leucocytes and platelets, except for the changes immediately after the hæmatemesis, which are stimulated by and proportional to the amount of blood lost. As the lesion in such cases is thought to be an obstruction of the portal or splenic veins, splenectomy alone is said to be of questionable value. In thrombocytopenic purpura the operation gave moderate relief of symptoms in two cases, and apparent complete relief in the remaining six of the eight cases reported. In Gaucher's disease the indications for operation are increasing fatigue and limitation of activity caused by the enlarging spleen, the development of a hypochromic anæmia with leucopenia and thrombocytopenia, and retardation in growth and development of the child. In this group splenectomy produced immediate relief from these troublesome signs and symptoms.

The Testing of Activity of Tuberculosis in Childhood.

W. AMBROSE MCGEE (*The Journal of the American Medical Association*, March, 1938) points out that although in the past few years many excellent reports have shown certain laboratory aids to be of great prognostic value for adults with tuberculosis, little such information is available in regard to tuberculosis in childhood. He has accordingly made a study of the relative value of the Schilling differential leucocyte count, the sedimentation rate, and the lymphocyte-monocyte ratio in forty children during a period of approximately six months. He states that more help in prognosis is obtained from information regarding the shift to the left and the sedimentation rate than from the lymphocyte-monocyte ratio *per se*, and that pathological changes are revealed at an earlier stage by the shift of the leucocytes to the left. The Schilling count is more easily performed on children, and has many advantages over the sedimentation rate. Less blood is required and children have much less fear of finger-pricks than of venous punctures. All kinds of blood cells can be studied in a stained smear. Differential counts can be made days after a slide has been stained, and stained smears can be kept as a semi-permanent record. In the author's opinion a combination of the shift percentage and the progressive changes in the percentage of lymphocytes and monocytes gives the optimum prognostic information. Laboratory tests should in no way be used to replace clinical and Röntgenological examinations, but should be used regularly in conjunction with them.

The Retention of Iron in Childhood.

JAMES H. HUTCHISON (*Archives of Disease in Childhood*, October, 1937) has conducted a series of iron-balance studies on in-patients at the Royal Hospital for Sick Children, in Glasgow, with a view to throwing some light on the problem of the absorption of iron and its fate after ingestion. The necessity for the use of massive doses of inorganic iron salts has until recently caused many workers to doubt if iron deficiency is the sole factor in the ætiology of nutritional anæmias. Heath, Strauss and Castle showed that the parenteral administration of iron in inorganic form resulted in 100% utilization, and because of this Fullerton sees no reason to postulate the existence of another factor, and suggests that the necessity for large doses is dependent, among other things, upon imperfect absorption. The author has made observations on the retention of iron over long periods in four non-anæmic and two anæmic children. In summarizing his results he states that the body is capable of retaining large amounts of iron, that only a small percentage of this iron is utilized for the synthesis of hæmoglobin, even in cases of severe anæmia, and that the necessity for giving large doses of iron by mouth does not depend on poor absorption by the intestine. No evidence was obtained that variations in gastric acidity influenced the retention of iron. The suggestion is made that the iron stored in the liver is unavailable for hæmoglobin formation, and that only iron which overflows from the liver into the circulation can be utilized for hæmoglobin formation. Massive doses are necessary to effect this.

Cardiac Complications of Acute Hæmorrhagic Nephritis.

MITCHELL I. RUBIN AND MILTON RAPOPORT (*The American Journal of Diseases of Children*, February, 1938) have studied fifty-five cases of acute hæmorrhagic nephritis in children. Severe myocardial damage was encountered in fourteen of the patients, twelve of whom had frank cardiac decompensation; hypertensive encephalopathy was encountered in five, and uræmia in but two. The only two deaths in the group were due to acute cardiac failure. The authors state that two factors are operative which may affect the heart adversely, namely, myocardial damage and increased peripheral vascular resistance. In regard to myocardial damage, it is possible that the infective agent which is responsible for the acute nephritis damages the heart. The occurrence of myocardial damage during the course of acute streptococcal infections, for example scarlet fever, appears to be fairly frequent, and Longcope and his co-workers have shown that the hæmolytic streptococcus is intimately associated with acute hæmorrhagic nephritis. The second factor, hypertension, is the agent immediately responsible for the impairment of cardiac function. The authors found that hypertension was present in all patients with acute hæmorrhagic nephritis who exhibited signs of cardiac insufficiency. They state that caution must be exercised in evaluating isolated readings of children's blood pressure, and that in the child with hypertension, elevation of the diastolic pressure is of greater import and is a more constant finding than elevation of the systolic blood pressure. The authors stress the importance of restricting fluids in acute hæmorrhagic nephritis with hypertension, for in the administration of liberal amounts of fluid there

is a danger of producing a further elevation of blood pressure and of precipitating a cardiac catastrophe. When there is no hypertension or cardiac involvement, fluids may be given in liberal amounts. In regard to the use of magnesium sulphate in the hypertensive cases, the authors believe that the beneficial effects which it produces are intimately connected with the relief of vasospasm and not with the amount of diuresis produced. They also state that cardiac damage is an immediate danger to life during the acute phase of hæmorrhagic nephritis, but that the ultimate prognosis as regards the heart itself is good, as only one of the twelve surviving patients who had had cardiac involvement showed residual cardiac damage.

ORTHOPÆDIC SURGERY.

Studies of Longitudinal Growth of Long Bones.

E. L. COMPERE AND C. O. ADAMS (*The Journal of Bone and Joint Surgery*, October, 1937) state that the exact nature of the physiological processes which regulate the rate and extent of long bone growth is still a mystery. Experimental evidence presented by various workers, however, indicates that all increase in length of the diaphyses of long bones, both prenatal and post-natal, occurs through enchondral growth, by multiplication of the cartilage cells of the juxta-epiphyseal region on the diaphyseal side of the epiphyseal cartilage plate. The epiphysis grows in length from the articular cartilage. The authors attempted to stimulate overgrowth of bone by trauma to the shaft with minimal injury to soft tissues. In the experiment quoted this was done by making three drill holes, the diameter of which was approximately that of the medullary canal of the femur, through the lateral and medial cortices, near the upper and lower metaphyses and in the middle of the shaft. They found that such trauma did not consistently cause growth stimulation and overgrowth. They then investigated the results of fracturing long bones in rabbits between metal markers inserted in the bone, but found no increase in the distance between the markers. Their results were in accord with those of other observers, who had concluded that the longitudinal overgrowth of bone following fracture of the shaft occurred entirely from stimulation of the epiphyseal growth cartilage and not from the cartilage of the fracture callus. They also found that minimal trauma to the diaphysis did not cause overgrowth, while fracture or osteotomy resulted in stimulation of longitudinal growth. This also occurred in each instance studied where a tibial full-thickness cortical graft had been removed. This growth stimulus resulting from trauma to long bones lasted only until healing of the defect in the bone was complete. Their observations also suggest that, following growth stimulation as a result of trauma, the growth rate may lag for a time in the operated limb, permitting the normal limb, which is growing at the normal rate, to gain in relative length. The basic stimulus of the longitudinal overgrowth is local hyperæmia, and some experimental evidence suggests that localized interstitial overgrowth may occur when chronic localized inflammation of the diaphysis due to an irritant foreign body is present.

Y. K. WU AND L. J. MILTNER (*ibidem*) describe the various clinical causes of variation in rate of growth of the bones of the extremities, such as trauma, infection, tumours, vascular disturbances, poliomyelitis and congenital anomalies. Either lengthening or shortening may result from the same ætiological factors acting during the active growing period of the epiphyses. Many workers have attempted to stimulate epiphyseal growth by various foreign materials, such as sterile water, tincture of iodine, carbolic acid, staphylococcus vaccine, alcohol or formalin, which were injected into the vicinity of the proximal epiphysis of the tibia, or by inserting foreign materials, such as iron, copper, lead, bone, camphor, thymol *et cetera*, through drill holes directly into, immediately proximal to, or distal to the distal epiphyseal cartilage plate of the femur. Shortening often resulted, but lengthening was never observed. Various experimenters agree that disturbance of one or more of the sources of blood supply to the bone is a factor which alters the rate of growth of the epiphyses. The authors repeated some of this experimental work, and failed to produce any significant increase in length growth by insertion of foreign material into a drill hole placed immediately distal to the proximal epiphyseal cartilage of the tibia, by indirect interference with the circulation of the bone, or by curettage of bone marrow. By chance, however, they observed stimulation of the length growth after stripping the periosteum from the shaft of the bone. This increase in length amounted to 5% to 15% of normal growth during the same period, and occurred during the first three months following the operation.

Internal Fixation in Recent Fractures of the Neck of the Femur.

R. I. HARRIS (*The Journal of Bone and Joint Surgery*, January, 1938) discusses fifty cases of intracapsular fracture of the neck of the femur treated by internal fixation in the fracture service of the Toronto General Hospital during the past three years. He thinks this method of treatment makes more complete fixation of the fragments possible, and simulates the situation existing in impacted fractures. Failure to secure bony union by the Whitman method is due to inability always to secure perfect fixation of the fragments. He has used the Smith-Petersen nail in all cases and concludes that this procedure, if the nail is properly placed, will secure bony union in every case. Good radiographs, particularly of the lateral view, are essential, no matter what time is required for them. He has adopted the routine of keeping the patient in bed for eight weeks after operation, although he admits that there is great diversity of practice in this regard among surgeons of his acquaintance. The nail must be made of an alloy of nickel and chromium, and the so-called high-nickel high-chromium alloy has been most satisfactory. The surface of the nail must be finished with a high polish. He believes that all fractures of the neck of the femur can best be treated by internal fixation. In this series there were five deaths, three from pulmonary embolus, one from cardiac failure, and one from sepsis of the wound. However, solid union and good function were obtained in 80% of the surviving cases.

W. W. PLUMER (*ibidem*) analyses 37 consecutive cases of fresh fracture of the femoral neck. The immediate post-operative results appear to justify internal fixation. Twenty-six of the patients are living, and of these, four have been operated upon too recently to be brought into the analysis. The remaining twenty-two are comfortably ambulatory. Although follow-up radiographs show a varying degree of neck shortening in all these cases, the author has been surprised at the absence of any signs of arthritic changes in these hips and the absence of muscle atrophy and loss of knee function associated with the use of plaster. He thinks that end-results should be classified in terms of walking function without relapse into external rotation deformity, rather than by Röntgenographic interpretations of the extent of bony trabeculation bridging the fracture line. All of the patients were operated upon through a lateral thigh incision after reduction of the displacement and mechanical fixation of the limb in internal rotation on the table. Utilization of the improved radiographic technique has now transformed this procedure into a precision operation. For fixation he has had consistently good results with the Moore multiple pins, but has now adopted the triradiate Smith-Petersen nail, which is made from chrome nickel steel and meets all requirements for this type of fixation. He concludes that fixation of recent fractures of the femoral neck, which can be accurately and successfully accomplished without the added hazard of arthrotomy, has been demonstrated by the work of many surgeons to be a reliable method of treatment.

British Medical Association News.

SCIENTIFIC.

A MEETING of the Section of Oto-Rhino-Laryngology of the New South Wales Branch of the British Medical Association was held on March 16, 1938, in the William H. Crago Council Room, British Medical Association House, 135, Macquarie Street, Sydney, DR. E. MCA. STEEL in the chair.

Antrum Infection.

DR. R. H. BETTINGTON read a paper entitled "Some Aspects of Maxillary Antrum Infection" (see page 853).

DR. R. J. MURPHY asked the speaker what he would do with patients sent for a search for a focus of infection, who brought a radiographic report that the antrum contained thickened mucosa. He knew what to do when pus was found on lavage, but he wondered what course should be adopted when the radiographic findings pointed to pathological change and clinical examination confirmed the radiological finding of mucosal change (polypoid or cystic degeneration).

DR. MILTON COUTTS considered that the subject had been adequately covered by Dr. Bettington's paper. Antrostomy in wrong cases had given a bad impression in the public mind. In children who had enlarged middle turbinals with ethmoidal infection, intranasal antrostomy was justifiable; and when the after-treatment of weekly lavage was carried out, cure would often follow. Radical operation was required if this course failed. In adults with foul discharge the condition might clear up with repeated lavage. If they had repeated attacks they might require operation, and would be better if operated upon. Patients with recurrent sinusitis had a peculiar odour that was quite distinctive. Bone reaction could be shown by a skilful radiographer, and was an important indication for radical operation. Some patients might have no discharge from the nose, but had attacks of dry throat and a burning feeling there preceding the antral "flares-up"; this was due to an irritant watery discharge from the antrum. He considered radical operation to be the correct treatment for repeated antral infections.

DR. NORMAN MEACLE considered that in children at least the intranasal operation often did some good. Even if the discharge continued, the cough and symptoms often abated. He noted that in many children who were supposed to have had their tonsils and adenoids removed, the clearing of the post-nasal space had been imperfectly done. He thought that this operation should be supervised. He had rarely performed radical operations in children.

DR. H. HARRISON said that he agreed with the speaker's remarks, but that he would inquire what course was to be recommended in patients in whom the radiographer reported polypoid changes in the antra. In some cases this was associated with a finding of vasomotor rhinitis. Many of these people were very uncomfortable, and in some nothing other than a radical operation would give relief.

DR. B. BLOMFIELD considered that the disrepute of the antral operation was due to the number of unsuccessful cases. Some patients did not do well even if they were adequately operated upon. In many cases the causes of the trouble were a septal deflection and bad nasal ventilation. It was important to correct the airway. He considered that infected tonsils were an important contributory feature, and if left behind would cause persistence of the sinus infection. His practice was to wash out the antra several times, to remove the tonsils and to straighten septal deflections. He hoped then for a recovery with lavage, but admitted that radical operation might be required later. The ethmoid cells were a frequent cause of failure. In children he considered that the ethmoid was proportionately large. The infection was probably primarily ethmoidal.

DR. GARNET HALLORAN said that he considered Dr. Bettington's address a timely counterblast to the over-conservatism of the past. In established chronic antritis in adults the results of intranasal antrostomy had on the whole been unsatisfactory; but, on the contrary, the results of the radical operation were very good. It was advisable to strip out the whole antral mucosa completely, and he believed that the specialized ciliated epithelium was regenerated in the antrum, as had been experimentally shown in the case of dogs. The results of intranasal antrostomy on children were uncertain, but he preferred it, although it might be regarded as the stepping stone to a possible radical operation at a later age.

DR. G. HALLIDAY thought the attitude of the profession generally to sinus disease was most important. Those patients with ethmoidal infection were the most difficult to cure and required a widely radical operation. When the antrum alone was to be operated on, probably 90% of the patients did very well. In the Edinburgh school the criteria for the radical operation as opposed to the intranasal operation were: (i) an infected antrum with polypi in the nose, (ii) an antral infection of dental origin, and (iii) foul secretion, when the bony wall itself was believed to be involved. Otherwise the intranasal operation was carried out when prolonged attempts to cure by lavage had failed. Dr. Halliday had a preference for the radical operation. With reference to the regrowth of ciliated epithelium, when the mucous membrane had been removed from the antrum, he had always found, on reoperation, that the cavity was filled with scar tissue and not lined with epithelium. Dr. Halliday would say to Dr. Halloran that dogs possessed a small antrum only, with a large opening into the nose, very different from that of the human, and they possessed no ethmoidal labyrinth. He did not consider that children's ethmoids were disproportionately large. He had not made up his mind about the proper procedure for children, but was definitely dissatisfied with the results of intranasal antrostomy.

DR. D. G. CARRUTHERS said that a definite feeling of alarm existed among the members of the public that antrum operations would not be successful. He had met with success with prolonged intranasal treatment in cases in which he expected to have to operate. When fluid would not flow he often used a second cannula. He also used constricting substances within the antrum, and when he had obtained a flow he used "Argyrol". He held that it was essential to deal with the ethmoidal extension when operating radically on the antrum. He agreed that the nasal opening should be well forward, and recommended the use of a post-nasal mirror inside the antrum to ensure that all the mucosa had been removed. He approved of the use of the mucosal flap, and recommended the use of intranasal suction during post-operative treatment.

DR. J. J. WOODBURN said that a degree of conservatism was advisable; many patients recovered with lavage alone. The Denker operation gave the best results. The two kinds of patients who did well were (i) patients with chronic antritis *per se* and (ii) patients with dental infection. The intranasal operation was opposed to physiological processes, and lavage was still required to remove the secretion. No true drainage was achieved by antrostomy. Allergic patients did not respond favourably. Operative skill appeared to have advanced beyond knowledge of the pathology and physiology of antral infection.

DR. E. P. BLASHKI said that he believed there was a place for intranasal antrostomy in the treatment of antritis. A number of patients recovered when the antra were better ventilated, and these patients did well with the intranasal operation. At least 30% of children were, in his experience, cured by it. He agreed with Dr. Woodburn that drainage was a wrong term and that the antrum did not really drain through an opening under the lower turbinal. He thought that rhinologists ought to be competent to read X ray films for themselves. Overlying bone shadows were sometimes reported as due to dulness within the antrum. Statements made on radiographic grounds alone, that loss of transradiancy in the

antrum was the result of infection or chronic infection, might be misleading, especially when they got into the hands of patients. He thought it absolutely necessary to extend the radical operation to the ethmoid area. He reminded members of the necessity to bear in mind possible malignant disease when dealing with antral disease in older patients. He avoided suture after radical operation, as the stitches presented a very great difficulty in the unusual patient who bled subsequently. The healing did not suffer at all from lack of stitches.

DR. H. B. HARWOOD was inclined to be conservative and to persist with lavage before undertaking operation. He said that he had found that operation might be disappointing when the indication had been an X ray report of a polypus on the floor. In such cases, if the fluid obtained by lavage proved clear, he did not operate. He had seen several peculiar cases during the past three years in which there had been no definite suggestion of direct injury to or fracture of the walls of the antrum although the patient had sustained a head injury otherwise. The first of these cases was that of a woman who had been struck on the forehead by a box, after which she had frontal headache. This became worse until Dr. Harwood saw her about two weeks later, when she complained of intense right-sided frontal headache and anosmia. X ray examination revealed dulness of the left antrum, which was clear on transillumination. When the left antrum was punctured a quantity of clear yellow fluid ran out under pressure. The patient said: "That has let it out of my head." A few shreds of pus were obtained on lavage. After two lavage treatments the sense of smell returned and symptoms disappeared.

The second case was that of a man who was injured on the head when he fell and who had similar symptoms of headache. When Dr. Harwood saw him eight months later, an X ray film revealed that the right antrum, ethmoid and frontal sinus were dull. On puncture of the right antrum some clear yellow fluid came out under pressure, with relief of the patient's headache. After puncture lavage proved impossible, but the patient said that the pressure caused by the attempt made the headache return and he felt dizzy. He wrote later that his headache had returned. He underwent antral puncture again, and again some fluid was evacuated and lavage was performed. His headaches then disappeared.

Dr. Harwood's third case was that of a man who had been hit in the left parietal region three weeks previously by a piece of timber. Next day he continued work, but he had headaches which became worse. The headache was dull and pressure was felt behind the eyes, especially on the right side. Five days before Dr. Harwood saw him clear fluid suddenly ran from the nose, with some relief of the headache. An X ray photograph revealed fracture of the base of the left anterior fossa and complete dulness of the left antrum Transillumination showed both antra to be clear. Puncture of the left antrum revealed no abnormality. Puncture of the right antrum produced a flow of clear yellow fluid under pressure. The fluid returned by lavage was clear, as was also that of a later lavage. The patient reported later that the symptoms had all abated after the first puncture and lavage.

The fourth case quoted by Dr. Harwood was that of a woman, whom he had seen two days previously and who suffered from gradually developing headaches with nasal discharge. On puncture of the left antrum clear yellow fluid was evacuated, followed by pus after lavage. She later stated that six months previously she had fallen about thirty feet onto her head. There was no history of injury to the antrum.

Dr. Harwood was unable to offer any explanation of the findings in these cases, but brought them forward as interesting instances of what he had found in a number of patients who had sustained head injury.

DR. H. J. EIZENBERG asked in what cases Dr. Bettington removed part of the middle turbinal, especially when operating on children.

DR. A. L. BRYANT asked in how many patients, whose condition had been apparently cured by repeated lavage, the symptoms and the disease returned. He had seen some recurrences a year or so later and had then had to perform a radical operation. He thought that septal deviations were important and should be corrected. When this was well done the antral symptoms would often abate.

DR. R. S. GODSALL agreed that there was an unfortunate attitude of distrust in the minds of some practitioners in respect to operations on the nasal sinuses. His opinion was that the operations were done much more efficiently nowadays than formerly, and that the results were better. The radical operation was very satisfactory when properly performed, and with an adequate opening made below the lower turbinal was practically always successful. While abroad he had observed that Ferris-Smith had gone back to the use of the flap formed from the lateral nasal wall. This he cut as large as possible and fixed in place with a small inflatable balloon introduced through the nose. Ferris-Smith also favoured the Denker operation. Dr. Godsall thought the opening should be made well forward. He did not approve of the intranasal operation and was surprised at its survival. He thought that patience with simple lavage was worth while, as many patients would be cured by it. He was not enthusiastic about the displacement system of Proetz, pressure and suction being used alternately with saline solution and ephedrine in the nose.

DR. A. L. CLOWES said that all were agreed that radical operation was frequently necessary in preference to intranasal antrostomy. It was impossible to lay down a course of treatment to be applied without particular reference to the requirements of the individual patient, both his surgical needs and his personality. Causes of failure in operating were mostly due to parts of the infected antral mucosa being overlooked, and to inadequate attention to the ethmoid and sphenoid extensions of the disease. It was essential also to have the opening as far forward as possible.

DR. E. McA. STEEL, from the chair, thanked the speaker for the practical nature of his paper and said he was grateful to members for making the discussion so complete. He was dissatisfied with the intranasal operation in children and thought that the adults in whom the condition would clear up with intranasal antrostomy would do equally well with repeated lavage by puncture. Allergy played a big part in the unsuccessful cases. Many people developed infection as a secondary manifestation on an allergic basis. These should be carefully tested and, if practicable, desensitized before operation. Treatment of infection confined to the antrum alone was highly satisfactory; but associated infection of the other air cells, and especially the presence of inaccessible ethmoidal cells, contributed largely to poor results. He thought that tonsil infection, associated with maxillary sinusitis, was often only secondary, and in many cases the condition subsided with the cure of the antrum. Treatment of infected teeth in relation to, but not apparently involving, the antrum might sometimes bring about a cure unexpectedly.

Dr. Bettington, in reply, thanked the members for their reception of his remarks. He said he was aware that his paper covered only some aspects of the problem, and it was not intended to be a complete review of the subject. In reply to Dr. Murphy he said that he had never seen patients improve when the only indication for operation had been a radiographic one. No single radiograph should be considered sufficient information, but a series was necessary for certainty of permanent mucosal thickening.

In reply to Dr. Meacle, Dr. Bettington agreed with the need for supervising the post-nasal space. He thought many children were cured by intranasal operation. He thought the majority were so cured. Breathing exercises were a necessary help in recovery. In reply to Dr. Harrison he said that he did not expect success in allergic cases unless the antral sepsis was the cause of the allergy. In reply to Dr. Blomfield, he agreed that deformities should be corrected, but thought that tonsil infection was always secondary to antral infection and never its cause.

In reply to Dr. Halliday, Dr. Bettington said that oto-rhino-laryngologists should direct their efforts to getting colleagues to make an earlier diagnosis and to avoid the

necessity for their dealing with widely-developed and widely-spread infections. He did not think nasal polyposis necessarily an indication for antral operating. In reply to Dr. Blashski he said that he agreed that radiographic reports often went beyond what could be found in the plates. In reply to Dr. Harwood he said that he was very interested in the findings in his cases. He had once sent some similar fluid for analysis and the report had said "mostly containing cholesterin". In reply to Dr. Eizenberg he said that he would point out the necessity for respecting and sparing the turbinates whenever possible. In reply to Dr. Bryant, Dr. Bettington said that the patients he mentioned as cured by prolonged courses of lavage had remained free of recurrences. He expressed his thanks for the illuminating remarks Dr. Godsall had made, and especially for the details he had given of the Ferris-Smith procedure.

NOMINATIONS AND ELECTIONS.

THE undermentioned have been elected members of the Victorian Branch of the British Medical Association:

Heard, Kenneth Harold, M.B., B.S., 1936 (Univ. Melbourne), Box 23, Omeo.
Jenkins, Trevor William, M.B., B.S., 1936 (Univ. Melbourne), Daru, Papua.
Lewis, Philip, M.B., B.S., 1936 (Univ. Melbourne), 29, Dickens Street, Elwood, S.3.
Marshman, Ray Samuel Alan, M.B., B.S., 1937 (Univ. Melbourne), Royal Melbourne Hospital, Lonsdale Street, Melbourne, C.1.
Rome, Ronald McKenzie, M.B., B.S., 1934 (Univ. Melbourne), Women's Hospital, Carlton, N.3.

Post-Graduate Work.

THE NEW SOUTH WALES POST-GRADUATE SCHOOL OF MEDICINE.

THE New South Wales Post-Graduate School of Medicine, at the Prince Henry Hospital, Sydney, was opened by His Excellency Lord Wakehurst, Governor of New South Wales, on Tuesday, April 5, 1938, at 3.30 p.m., in the presence of a large and distinguished gathering. His Excellency, who was accompanied by Lady Wakehurst, was met on arrival by Mr. F. W. Marks, Chairman of the Board of Directors of the hospital, and Mr. Justice P. Halse Rogers, Chancellor of the University of Sydney, and was conducted past a guard of honour of nurses to a dais which had been constructed in front of the administrative building.

On the dais with His Excellency, besides the Chairman of the Board of Directors of the hospital and the Chancellor of the University, there were the following: the Honourable Sir Philip Whistler Street, K.C.M.G., Lieutenant-Governor of New South Wales; the Honourable B. S. B. Stevens, M.L.A., Premier of New South Wales; the Honourable H. P. FitzSimons, M.L.A., Minister for Public Health; Professor H. R. Dew, Dean of the Faculty of Medicine in the University of Sydney; Dr. T. W. Lipscomb, Chairman of the New South Wales Post-Graduate Committee in Medicine; Alderman R. F. Burke, Mayor of Randwick; Mr. R. J. Heffron, M.L.A.; Mr. J. T. Jennings, M.H.R.; Sir Charles Blackburn, President of the Australasian College of Physicians; Sir Henry Newland, President of the Federal Council of the British Medical Association; Captain K. O'B. Harding, Private Secretary to His Excellency the Governor; and Dr. C. J. M. Walters, General Medical Superintendent of the hospital.

Mr. Justice P. Halse Rogers, Chancellor of the University of Sydney, said that the ceremony marked the beginning of a new era in the history of medical education in New South Wales and, he hoped, the beginning of a period of great development. It was universally recognized that medical research had become of supreme importance and that post-graduate teaching was just as necessary as that which gave the fundamentals to a student and fitted him to commence the practice of his profession. The life of a medical man was one of continual learning. The developments in medical science were so rapid that it was difficult for the practitioner engaged in his daily routine to keep pace with them. But it was imperative that he should do so if the health services of a community were to be kept in an efficient state. It was because of the recognition of that fact that they had attended that day to ask His Excellency to declare open the New South Wales Post-Graduate School of Medicine at the Prince Henry Hospital. The school was the outcome of the enthusiasm and activity of the Post-Graduate Committee in Medicine of the University of Sydney. The desire was that the medical graduates of the University of Sydney should have similar opportunities to those that were open to medical students in Great Britain and America and other parts of the world. They held that it should no longer be necessary for the young graduate to go abroad to train for his higher degrees; they felt that he should have his chance of thoroughly equipping himself in Australia. And they had worked to give him that opportunity. But their efforts could not have brought matters so speedily to the present stage had it not been for the support given by the Government, the Minister for Health and the Hospitals Commission of New South Wales, and the cooperation of Mr. F. W. Marks, the Chairman of the Board of Directors of the hospital.

There had been criticism of the project from many angles, and there had been criticism of the site. But the school was in being, and if enthusiasm could carry it to success there could be no doubt about its future. Directors had been appointed in surgery and medicine, and the names of Dr. H. R. G. Poate and Dr. S. A. Smith, men well known and esteemed in their profession, inspired confidence as to the work that would be done there.

The Chancellor said that he had spoken of the necessity for the general practitioner to keep abreast of the times and to follow scientific developments. The general practitioner would have an opportunity to do that by refresher courses. The man from the country would be able to come and work with leading specialists and would no longer feel himself cut off and isolated. And so throughout the country the service for the community would be improved. Equally important would be the intensive training of young graduates for higher degrees. There would be encouragement for men to continue their studies in residence at the hospital under the most favourable auspices, and so standards would continually be maintained at a high level.

The Senate of the University had not such a direct connexion with the post-graduate school as with its own medical school; but the post-graduate committee worked in conjunction with the university authorities, and by the connexion maintained with the university the senate hoped that the best results would be obtained.

It would be agreed that when the Government had completed the work that it was doing at the hospital, those who came there for training would work under the best auspices and in wonderful surroundings.

The Chancellor said that his duty was not to make a speech; others more qualified for speaking on this occasion were to follow. His pleasant task was to ask His Excellency to declare the school open.

In declaring the school open, His Excellency said that it was with great pleasure that Lady Wakehurst and he had come there that afternoon to take part in a function that marked an important advance in the medical progress of this country—the opening of the New South Wales Post-Graduate School of Medicine. The provision of this new centre for clinical teaching was a noteworthy contribution to those efforts which were continually being made by the medical profession to increase its capacity for the service of mankind and the promotion of the health of their fellow citizens. Many of those present had reason

to be thankful for the skill and care that they had at some time or other received from the members of that profession.

His Excellency was confident that the post-graduate school was destined to play a very important part in the future of medicine in this country.

It was his earnest hope that the school, with its happy union of ward and laboratory, university and hospital, drawing students and teachers alike from regions more widespread than this State and Commonwealth, might prosper and progress; that it might play an imperial rôle in the winning and dissemination of medical knowledge, in the relief of suffering amongst the people of this country, and in enabling the doctors to come together in a task in which all must be allies and helpers.

The Honourable H. P. FitzSimons, Minister for Public Health of New South Wales, said that the establishment of a permanent post-graduate school in medicine under the authority of the University of Sydney was the most important step that had been taken in medical development in New South Wales for many years, and to his mind opened the gateway to a new era in medical advancement in Australia. Although excellent work had already been done by the New South Wales Post-Graduate Committee in Medicine by the provision of regular courses in both city and country areas, the work had not been fully effective because of the lack of a permanent clinical school, continuous teaching and continuous research.

The Government had recognized the disabilities under which the medical profession was suffering in this regard, and he had been entrusted with the responsibility of creating at the Prince Henry Hospital the machinery whereby the University of Sydney could provide for all time this very urgent and very important side of medical education.

There were two aspects of post-graduate teaching with which the Government was vitally concerned. The first, and in his opinion the more important, was the immediate post-graduate teaching of the newly-fledged graduate.

In the *Medical Practitioners Bill*, which would be submitted to Parliament during the approaching session, it had been provided that every new graduate must first serve for one year as a resident medical officer of an approved hospital or clinic before being granted the right to start private practice; but by the development of a post-graduate school of medicine they were going a step further. It would be possible for the new graduate, having completed his year as a junior resident medical officer of a public hospital, to develop further his technical knowledge and skill under expert supervision and guidance at an institution specially adapted for that purpose.

The second aspect, which was almost as important, was the provision of refresher courses for medical practitioners who had already been in practice, particularly in country areas, for some years.

Obviously, for economic reasons, it was not possible for the average medical practitioner, especially with family responsibilities, to go abroad, and furthermore, Mr. FitzSimons was certain that he could be as well trained in Australia as in any part of the world; but it was essential that he should be acquainted with modern methods in both surgery and medicine. The science of medicine was ever changing; there was always some improvement, something new, and it was of vital importance to the average person that the family doctor should be able to make his diagnoses and to treat his patients in accordance with the latest practice.

The policy of the Government in developing country hospitals and furnishing them with the best and most modern equipment made it essential for the average practitioner to have his medical knowledge refreshed at regular intervals and to be taught to use scientifically and skilfully new instruments and apparatus.

He desired to congratulate the University of Sydney, the New South Wales Post-Graduate Committee in Medicine, and the board of directors of the hospital on the splendid work that had already been done for the development of the school. He now appealed to the rank and file of the medical profession to cooperate with these bodies in the advancement of the institution. While he recognized that it was impossible to have unanimity of opinion in matters medical, he wanted to remind the medical profession of its responsibilities to the general public. In the hour of serious illness they virtually became the arbiters of life and in most cases the guardians of the economic happiness of the community. He knew that the great majority of the members of the profession recognized that they had a duty both to teach and to learn, and the Government would play its part in providing the necessary facilities that this might be accomplished.

Professor H. R. Dew, Dean of the Faculty of Medicine, said that he had the honour to represent the Faculty of Medicine by virtue of the fact that he was for the time being the dean of that faculty. The faculty had for its main function the direction of the education of some seven hundred undergraduate students of medicine. The course was spread over a period of six years, and every year approximately eighty graduated and passed into the wider field of medical practice. During their rather strenuous period of training the students obtained a very sound grounding in the fundamentals of medical science, particularly in anatomy, physiology and pathology, without a sound knowledge of which a correct training was impossible. They also met disease at close quarters and learnt not only to systematize their attack on medical problems, but also how to profit by and learn from their future experiences. The final product was recognized all over the world as equal to the best, and the record of the achievement of Sydney graduates was a fine one. For the past fifty years these graduates had in both town and country carried out their duties conscientiously and with efficiency and very often with real distinction, frequently under adverse conditions. Professor Dew was moved to emphasize this because from time to time one heard unwarranted and often uninformed criticism of the standard of work of the rank and file of the medical profession.

Nevertheless, such was the rapidity of the advances of medical science that it was very difficult for many doctors to keep pace with them, and it had become realized everywhere that it was advisable to provide facilities and organized instruction at the larger centres, to which doctors generally could return from time to time and learn something of the newer advances at first hand. There were, of course, many other aspects of post-graduate work that were also important, particularly the training of doctors along special lines and the institution of special classes, lectures and demonstrations concerning which there was no time to speak at that moment. That day they had seen the inauguration of activities that had as their aim the provision of the facilities referred to and an attempt to satisfy the demand for post-graduate instruction. As such they must meet with the approval and gain the support of all those interested either in medical education or in the maintenance of a high standard of general medical practice.

It was perhaps appropriate to mention that medical education was a very expensive business. He was sure that the Chancellor would agree with that. The annual budget of the Faculty of Medicine, without taking into consideration the expense incurred by the teaching hospitals in respect of student work, amounted to over £40,000, and it was not nearly enough to do all that the faculty wanted to do. This was mentioned to draw the attention of those in charge of the financial side to the fact that they would have to be prepared to spend fairly lavishly if this new venture was to develop as it should.

In conclusion, Professor Dew said that it only remained for him, on behalf of the faculty, to congratulate the board of directors of the hospital on the fact that their hospital had been selected as the main post-graduate hospital under university auspices, to congratulate the newly appointed directors of the units, to assure them of the support of the faculty in all teaching matters, and to express the hope that these new post-graduate activities would achieve the success they undoubtedly deserved.

The Honourable B. S. B. Stevens, in proposing a vote of thanks to His Excellency the Governor, said that as the head of the Government he was entirely in accord

with all the steps that had been taken in the development of the hospital and the formation of the school. That afternoon's function had been an auspicious augury of a movement that brought the State into line with other world centres for increased educational facilities. He would remind those present that it was a happy coincidence that that official function coincided with the end of the first year of office of His Excellency and Lady Wakehurst.

Dr. T. W. Lipscomb, Chairman of the New South Wales Post-Graduate Committee in Medicine, in seconding the vote of thanks, said that with the example before them of developments in medicine in Europe and the United States of America, and particularly of the British Post-graduate Hospital and School at Hammersmith, his committee had decided to work towards a similar objective. And that day, with the opening of their post-graduate school and hospital, one of their dreams had come true and they were optimistic enough to believe that, facilities being available, more and more graduates would make use of them.

His committee was deeply sensible of the ever-ready cooperation of the university, of the chairman and board of directors of the hospital, and particularly of the sympathetic attitude of the Government of the State, and the Minister for Health, the Honourable H. P. FitzSimons.

Dr. Lipscomb then reminded His Excellency that in a few days' time he would have been in New South Wales one year, and he asked him to accept a silver salver as "a birthday gift" and as a reminder of Their Excellencies' presence that day.

His Excellency in reply expressed his thanks for the handsome gift and his pleasure at having been able to be present.

The formal business having concluded, His Excellency inspected several of the wards of the hospital, whilst Lady Wakehurst inspected the nurses' home. Tea was then served.

The ceremony was held in the open air, in bright sunshine.

The opening of the school is the result of persistent endeavour on the part of the New South Wales Post-Graduate Committee in Medicine, with the cooperation, since its formation in 1936, of the board of directors of the hospital. Their work would have been in vain, however, had it not been for the assistance given by the Government of New South Wales, and more particularly by the Honourable H. P. FitzSimons, Minister for Public Health.

The Prince Henry Hospital is situated at Little Bay, about eight miles from the centre of Sydney, in picturesque surroundings. It has its own beach and a nine-hole golf course, and there is ample space for expansion.

There are 750 beds available; but the hospital must be prepared, under the act governing it, to provide at any time 300 beds for infectious diseases. It is expected later that the total number of beds will be increased to 1,000.

The hospital has been specially organized to provide for post-graduate teaching and research, and has been divided into three main departments: medicine, surgery and pathology. The director of medicine, Dr. S. A. Smith, and the director of surgery, Dr. H. R. G. Poate, have already been appointed, on a half-time basis. The directors have been appointed by the university as post-graduate lecturers in medicine and surgery respectively, and have been given control of their departments by the board of directors. Under the director of each of the departments of medicine and surgery is a unit of 100 beds. This is thought to be a sufficiently large number to allow post-graduate students to participate directly in the practice of the hospital under the director. The board of directors of the Prince Henry Hospital has agreed to provide senior and junior fellowships in medicine and surgery to members of the staff of the units. The details of the actual composition of the units have not yet been decided. Apart from this, an honorary staff is about to be appointed.

Provision has been made in the constitution of the hospital to bring it into close contact with university departments, by the creation of an associate honorary staff. Besides others, all teachers in the subjects of the curriculum of the Faculty of Medicine are *ex officio* members of this associate staff and are available to the staff of the hospital at any time for consultation. Provision has also been made in the constitution for machinery that makes it possible to attach to the hospital for limited periods selected teachers who may be granted permission to participate in the work of the hospital. This has already been done during a recent course.

A number of students are at present associated with the school for research or training; but it would seem that the school must go through a purely formative period. It is probable that it will take some years for arrangements for teaching to be complete; furthermore, appointments and buildings are required. In the meantime it is proposed to proceed as far as the available facilities will allow, and gradually to mould the school, by greater experience and knowledge, into its stable form.

Obituary.

THOMAS JOHN MOORE KENNEDY.

THE death of Thomas John Moore Kennedy has robbed the city of Geelong of one of its best-loved and most highly respected citizens. Kennedy was born on June 9, 1867, in County Galway, Ireland, and that same year was brought by his father, the late Reverend Robert Kennedy, to Australia. Kennedy was educated at Clarendon College, Ballarat, under the headmastership of his father. He lived at Ormond College while he was engaged with his medical studies at the Melbourne University. He gained his qualifying degrees in 1888. He occupied the position of resident surgeon to the Women's Hospital and the Melbourne Hospital before being appointed resident surgeon to the Geelong Hospital in 1890. He occupied the latter position for some seven years, but obtained leave of absence in 1895 to go abroad for post-graduate study. In 1897 he commenced private practice at Geelong and was appointed honorary surgeon to the Geelong Hospital, a position he held till his retirement, when he became honorary consultant surgeon. He was appointed medical officer to Geelong College in 1901 and held that office for thirty-five years. He was also medical officer to the Geelong Church of England Grammar School for a period of twenty-five years. In addition he was medical officer to the Morongo Presbyterian Girls' College. The headmaster of Geelong College has stated that Kennedy's experience of boys and parents and schools, apart from his medical knowledge, made his opinion of the greatest possible value to the schoolmaster.

Kennedy's chief recreations were yachting and billiards. In 1893 he won the Saint Kilda Yacht Club's annual open race with his yacht *Beta*, and in 1894 he won the Royal Yacht Club's open race for the trophy presented by the late Commodore J. Bracebridge Wilson.

Many of his contemporaries numbered among his friends predeceased him. He could claim the friendship of many distinguished members of the profession. He belonged to the coterie that included Richard Stawell, George Syme, Hamilton Russell and A. J. Wood. Some of the group remain among us to mourn his loss.

Thomas John Moore Kennedy leaves the happy record of a great lover of men, and a man who was himself beloved by people in all walks of life. We offer to Mrs. Kennedy our sympathy in her hour of tribulation.

Dr. A. Norman McArthur writes:

I knew the late Thomas Moore Kennedy as a very dear loyal friend, who was very well informed with much common sense. I was at Ormond College with him and remember him as an earnest student who could not find time for recreations and played very little billiards. Later, when he was established in practice at Geelong, he played billiards at the club, but many could beat him, so he took lessons from Charlie Memmott, the professional, and

improved his game greatly. Kennedy's other recreation was yachting, and he became the best yachtsman in Geelong and the local commodore. At one period every year he went yachting to the islands off the coast of Queensland, taking with him one or two convivial souls who were able to retain their dignity in turbulent seas. For approximately thirty years I have been on the Geelong College Council and many times we have had to call Tom Kennedy in for advice. His habit was to keep quiet, look and listen and let the council members do the talking. When appealed to he would straighten out tangles and difficulties and clarify everything for us. He was really great. Two years ago, after he had resigned his position as the school medical officer, he was our chief guest at the Old Collegians' Association dinner and was presented with a silver tea and coffee service in recognition of his splendid work at the college.

I never saw him operate; but I have been told that his surgery was thorough and well thought out and the results excellent. He was not a man of outstanding brilliance, which, after all, is not always necessary, and his strong point, I am told, was his accuracy in diagnosis. Nobody perhaps knew him personally better than I; but others of his colleagues in Geelong must know something of his great work.

Dr. Konrad Hiller writes:

In the passing of Thomas John Moore Kennedy there has gone another of those men who pioneered the way to modern surgery in the provincial towns.

When Kennedy entered into practice, Listerian principles had just become established; but they were not generally practised. There was therefore for the young surgeon ample opportunity for raising the standard of surgery. This Kennedy did with the care and thoroughness which were characteristic of him.

What Syme, Moore, Bird and others were to Melbourne, Kennedy was to Geelong and a large part of the western district of Victoria.

Of a keen and active disposition, he spared neither time nor expense in keeping abreast of modern technique, knowledge and thought. He read widely and thought nothing of coming up to Melbourne—at that time a more laborious matter than at present—to witness some surgical procedure of which he had heard and which he was himself eager to perform when the occasion arose, or to attend some demonstration or address at which he might see or hear for himself what was going on in the professional world, and so add to his knowledge for the welfare of his patients.

Whilst his natural inclination was towards surgery, he was a general practitioner of outstanding ability, and though many will remember him for his operative skill, many more will think of him as the wise and kind doctor whose advice was always sound, tempered as it was with humanity and common sense.

He was a lovable man. To him the limelight was a thing to be shunned. He did not hesitate to express his opinion on current topics or on others, but never allowed his feelings to warp his judgement nor to cause him to say things to the detriment of his fellows. It was hardly to be wondered at, therefore, that he was widely known both in and outside of the profession. Over and over again one heard patients who had transferred from Geelong to Melbourne, and whom Kennedy had had under his care, speak with gratitude and appreciation of him and of his efforts on their behalf.

Even in his last illness his old friends and patients were mindful of him, and many were the inquiries which were made directly and indirectly on his health. To them and to us Geelong will not be the same without Tom Kennedy.

To his wife all will desire to express their deepest sympathy.

Dr. R. L. Fulton writes:

By the death of Dr. T. J. M. Kennedy Geelong has lost one of its best-known citizens and the medical profession has lost its oldest practising member in the district.

Dr. Kennedy first came to Geelong as resident medical officer to the old Geelong Infirmary and Benevolent Asylum and remained in that position for seven years before commencing private practice in the town. Both as a resident medical officer and later as a private practitioner his greatest interest was in surgery, and he rapidly built up a large surgical practice. He also endeavoured to keep himself up to date in all other branches of medicine and for many years acted as honorary physician and surgeon to his old hospital.

When a new hospital was built he felt that the time had come for him to make way for a younger man—an action that was typical of him—and he retired from the honorary staff a year before reaching the retiring age and was immediately appointed an honorary consultant.

When the modern theatres were built for the new hospital the committee paid him the compliment of asking him to perform the first operation.

For a number of years he devoted considerable time to British Medical Association affairs, and on several occasions was president of the Geelong subdivision, and was its representative on the Victorian Branch Council during the lodge dispute.

The practice of his profession was always his first consideration; but he had many outside interests. His home life and his library gave him his greatest pleasures, and the sympathy of the profession goes out to his widow. He was a keen yachtsman; he built his first boat himself when he was a resident medical officer, and some of his happiest hours were spent boating and fishing.

In addition he was a great club man, and on several occasions acted as president of the Geelong Club, where he was also usually the reigning billiards champion.

FRANK ROBERT LEGGE.

We regret to announce the death of Dr. Frank Robert Legge, which occurred on May 1, 1938, at Malvern, Victoria.

Correspondence.

MATERNITY AND SOME OF ITS PROBLEMS.

Sir: The address of Dr. H. S. McLelland published in your number of April 16, 1938, must surely be a clarion call to all who feel, with him, that the problem of the abortionist is one of the biggest evils in our life today.

Would that Dr. McLelland's words were true, that, "with the exception of a very small number of degenerates, doctors and nurses have resisted the evils" *et cetera*. Is the number "very small"? If it be very small, why do not the members of the profession seek by concerted action to make this number non-existent? Surely we have a public duty as well as a duty to our profession (the latter covered by the smug phrase "medical ethics"). Cases come to the notice of all of us of patients who openly tell us "Dr. So-and-So fixed me up", and we are bound by "medical ethics" not to disclose this fact and ask for an inquiry by the Council of the British Medical Association. "Doctors and the rulers of men" are at opposite poles today, for any doctor who seeks to lead in public life without the sanction of his Branch council is surely heading for a reprimand "that he is seeking advertisement".

A lamentable sidelight on our apathy toward the abortionist has come to my notice this week. In *On Dit*, the weekly paper of the Adelaide University Union, under date of April 26, is an article by a medical student advocating the legalizing of abortion. If one remembers that this was issued the day after Anzac Day, what a sad reflection it is that the men of Anzac should find today that civilization (?) can no better perpetuate their memory than by racial suicide.

During the past year or so consideration was given by the Federal Council and Branch councils to the problem

of the abortionist; and what has resulted? Absolutely nothing whatever of genuine effort to clear up the Augean stables of civilization, where we, members of what should be the noblest profession, wallow in the mire.

Yours, etc.,

H. M. FISHER.

Gawler Chambers,
188, North Terrace,
Adelaide.
April 28, 1938.

DR. CHARLES LAVER.

SIR: Dr. Edye has made a slight error in his historical address. He writes of Dr. Charles Laver: "his name is a household word at Kalgoorlie, where he still lives; and the town of Laverton is named after him".[1] Unfortunately Dr. Laver died in Kalgoorlie last year. He was the greatest celebrity on the goldfields, and many old prospectors speak of his kindly qualities and extravagant generosity. One of his brothers was in the Australian Eleven, and another a professor of music in Melbourne.

Yours, etc.,

F. SIMPSON.

271, Cambridge Street,
Wembley,
April 29, 1938.

BILATERAL CONGENITAL DISLOCATION OF THE HEAD OF THE RADIUS.

SIR: The case of bilateral congenital dislocation of the head of the radius reported by Dr. Thomas Rose in the journal of April 23 draws attention to a condition which raises a point of possible medico-legal importance. The condition is probably not as uncommon as the lack of reference to it in the literature would give one to understand. McFarland[(a)] has recently reported thirteen cases, all unilateral. He makes clinical and radiological observations on the differential diagnosis from traumatic dislocations. In one case, which I was privileged to see, a fractured ulna had united in good position, but the parents complained that dislocation of the radial head remained, causing interference with function. From radiological evidence it was established that one was dealing with a congenital dislocation. The importance of recognizing the congenital condition is obvious.

Yours, etc.,

ESMOND F. WEST.

Goldsbrough House,
172, North Terrace,
Adelaide.
April 30, 1938.

Reference.

(a) *The British Journal of Surgery*, Volume XXIV, Number 93, 1936, page 41.

THE EXTENDED SCHWARTZE OPERATION.

SIR: Dr. Gutteridge's article on the extended Schwartze operation, appearing in THE MEDICAL JOURNAL OF AUSTRALIA on April 30, 1938, contains a serious error when he refers to Bondy's operation with the words: "The facial ridge is reduced, the bridge remains intact."

Bondy removes the bridge and does not leave it standing. Indeed his personal comment on the Heath operation is that it is faulty because it allows the bridge to remain. He claimed that the Heath operation went too far when a simple mastoid operation was required and not far enough when any kind of conservative radical operation was indicated.

I believe that in England the practice of removing the incus when performing a conservative radical mastoid operation is frequently advocated, and I had always been informed that this practice actually derived from Jenkins.

When the plastic on the posterior wall is omitted from the Bondy operation it should be called "Bárány's operation"; but it possesses undesirable features and I do not think it is to be recommended.

Yours, etc.,

ERIC P. BLASHKI.

193, Macquarie Street,
Sydney,
May 2, 1938.

PINK DISEASE OCCURRING IN AN ADULT.

SIR: Dr. Doig's case of pink disease in an adult reported in the journal of April 30, 1938, is of very great interest; for, as he says, the disease is almost entirely confined to children in this country. I have seen one case in a child of seven years and one in an adult of thirty-two. He was a farmer of German-Polish extraction from a district within 100 miles of Brisbane. For some months he had an intolerable itching of the skin, with occasional sudaminal rashes, while his hands and feet were red and swollen, the feet less so than the hands. The patient's mental state was the most remarkable feature of the disease. He was intensely depressed and wretched, so much so that a doctor whom he had seen in the country diagnosed "melancholia".

He had little or no sleep—a statement supported by his wife—and his appetite was bad.

Unfortunately he would not remain in Brisbane long enough for any complete investigations to be carried out; but his insomnia resisted even large doses of barbiturates.

Dr. T. R. Biggs, my colleague at the Hospital for Sick Children, saw him with me, and we agreed that had he been thirty years younger our diagnosis would not have been a moment in doubt.

The Secretary of the Pædiatric Section of the British Medical Association annual meeting in Melbourne, 1935, was apparently more sceptical, as my report of the case at the discussion on pink disease was not published by him in the proceedings.

I must thank Dr. Doig for the references to *The Journal of the American Medical Association* article, which I had missed.

Yours, etc.,

S. F. MCDONALD.

217, Wickham Terrace,
Brisbane, B.17,
May 3, 1938.

NATIONAL HEALTH INSURANCE.

SIR: It would be a calamity if national health insurance were to arrive here with the members of our profession as little informed as were the doctors of England and Scotland in 1912 of the principles and intentions underlying the new law.

Most of us knew little more than that we were being organized by the British Medical Association to resist an attempt to employ our services under contract for insufficient pay.

It was thus that we were pilloried in the Press and the House of Commons as parasites, out for our pint of blood from the body politic instead of guardians of the health of that body.

In your number of April 16 Dr. Cowan deplores the absence of a lead by the British Medical Association, and it would seem certain that it will be left to each one of us who will be affected by the arrival of such legislation, to inform ourselves upon how we may, in spite of any deficiencies in the act, so conduct our professional service to the community that the purpose underlying the measure is achieved and the health of our nation become insured.

Even if the Australian act should show no advance upon the British one, which would be a great misfortune, it is my intention to prove that even that well-hated and much-maligned measure does contain the true germ of preventive medicine; and further, that its failure has been in part the result of the unfortunate fact that most of the men who were then forced to accept panel service, did so with the belief that they would be underpaid, and heartily hated it.

Contract practice makes it profitable for the doctor to do his utmost to prevent his patient becoming ill.

If he educates his panel people to come to him for trivial disorders, or even while well to come to him periodically for the early detection of defective function, he is not only doing prophylactic practice and lowering the sickness incidence among his insured workers, but is doing so without injuring his income. Indeed, to the extent in which he succeeds he is liberating himself for further remunerative work, or research, study and other recreation.

From over twenty years' experience of panel practice I can affirm that the supposed bugbear of contract practice, namely, that patients will pester the doctor unnecessarily when the fear of the bill is removed, is negligible, and on the contrary, the great difficulty is to educate patients to use their doctor prophylactically, so ingrained is the association in the public mind of doctor with illness, and so strong the convention that one should wait till one is "really ill" before seeking his aid.

How can we get our people to look on us rather as makers and teachers of health than merely treaters of disease? I venture to submit that if we could persuade the framers of the bill to make such service a part of the work for which we are contracted, a great step forward would have been taken.

It should be made clear to all whose contributions are each week deducted from their wage, that these are in part paid to the doctors for the prevention as well as for the treatment of illness.

So strongly does my experience convince me of the value inherent in the contract system that I would gladly welcome its institution not merely for the 1,850,000 wage-earners, but as the accepted method of remuneration for every person in the country, for this fundamental reason: by its adoption the financial interests of the patient and the doctor are made identical.

Under the system of payment for attendance upon disease, the better the health of the patients, the less the income of the doctor. Indeed, if we can imagine a prolonged wave of health in our community, we must envisage a period of anxiety and even poverty; whereas it would be the height of stupidity for a contract doctor not to do all in his power to maintain such a state in his public for as long as possible.

For the *National Health Insurance Act* to come into force as it did in England, with the unwilling and reluctant cooperation of the medical profession, would be the greatest misfortune and would tend to a repetition of the history of its failure there.

Yours, etc.,

S. BOYD.

Gnowangerup,
Western Australia,
May 1, 1938.

The Royal Australasian College of Surgeons.

MEETING OF THE BOARD OF CENSORS.

THE next meeting of the Australian Board of Censors of the Royal Australasian College of Surgeons will be held at the college, Spring Street, Melbourne, C.1, probably in September, 1938. Candidates who desire to present themselves at this meeting should apply to the Censor-in-Chief for permission to do so on or before June 30, 1938. The appropriate forms are available at the college and at the offices of the various State secretaries.

Proceedings of the Australian Medical Boards.

TASMANIA.

THE undermentioned have been registered, pursuant to the provisions of the *Medical Act*, 1918, of Tasmania, as duly qualified medical practitioners:

Panting, Rona May, M.B., B.S., 1934 (Univ. Melbourne), Waratah.

Alsop, Charles James, M.B., 1893 (Univ. Melbourne), Sheffield.

Barrett, Edgar Alfred, M.B., B.S., 1892 (Univ. Melbourne), Geeveston.

Tremayne, James Henry Russell, M.B., Ch.B., 1930 (Univ. Sydney), Dover.

Lewis, Philip, M.B., B.S., 1936 (Univ. Melbourne), Port Cygnet.

NEW SOUTH WALES.

THE undermentioned have been registered, pursuant to the provisions of the *Medical Act*, 1912 *and* 1915, of New South Wales, as duly qualified medical practitioners:

Last, Raymond Jack, M.B., B.S., 1924 (Univ. Adelaide), 37, Clifton Street, Prospect, South Australia.

Milroy, William Hugh, M.B., B.S., 1935 (Univ. Melbourne), Wollongong.

O'Toole, Cyril Paul, L.L.M., 1927, R.C.P., R.C.S. (Ireland), School of Public Health and Tropical Medicine, University of Sydney, Sydney.

Sapsford, Lionel Pelham, M.B., B.S., 1937 (Univ. Sydney), Brisbane.

Wallace, Bernard, L.L.M., 1909, R.C.P., R.C.S. (Ireland), 10, Garden Vale, Bayswater Road, King's Cross.

Books Received.

PAPERS ON PSYCHO-ANALYSIS, by E. Jones, M.D., M.R.C.P.; Fourth Edition; 1938. London: Baillière, Tindall and Cox. Medium 8vo, pp. 654. Price: 25s. net.

YOUR DIET AND YOUR HEALTH, by M. Fishbein, M.D.; 1937. New York: McGraw-Hill Book Company Incorporated; Australia: Angus and Robertson Limited. Large crown 8vo, pp. 308, with illustrations. Price: 15s. net.

PRACTICAL BACTERIOLOGY, HÆMATOLOGY AND ANIMAL PARASITOLOGY, by E. R. Stitt, M.D., Sc.D., LL.D., P. W. Clough, M.D., and M. C. Clough, M.D.; Ninth Edition; 1938. Philadelphia: P. Blakiston's Sons and Company Incorporated. Demy 8vo, pp. 974, with illustrations. Price: 42s. net.

A TEXT-BOOK OF BACTERIOLOGY FOR DENTAL STUDENTS, by A. Bulleid, L.R.C.P., M.R.C.S., L.D.S.; Second Edition; 1938. London: William Heinemann (Medical Books) Limited. Demy 8vo, pp. 224, with illustrations. Price: 15s. net.

A SHORT TEXTBOOK OF SURGERY, by C. F. W. Illingworth, M.D., F.R.C.S.; 1938. London: J. and A. Churchill Limited. Medium 8vo, pp. 710, with 8 plates and 179 text figures. Price:

A TEXT-BOOK OF X-RAY DIAGNOSIS, by British Authors, in three volumes; edited by S. C. Shanks, M.D., P. Kerley, M.D., M.R.C.P., D.M.R.E., and E. W. Twining, M.R.C.S., L.R.C.P., D.M.R.E.; Volume I; 1938. London: H. K. Lewis and Company Limited. Crown 4to, pp. 610, with 398 illustrations. Price: 50s. net.

A HISTORY OF WOMEN IN MEDICINE FROM THE EARLIEST TIMES TO THE BEGINNING OF THE NINETEENTH CENTURY, by K. C. Hurd-Mead; 1938. Haddam: The Haddam Press. Medium 8vo, pp. 585, with illustrations. Price: $6.00 net.

Diary for the Month.

MAY 17.—New South Wales Branch, B.M.A.: Ethics Committee.
MAY 18.—Western Australian Branch, B.M.A.: Branch.
MAY 19.—New South Wales Branch, B.M.A.: Clinical Meeting.
MAY 24.—New South Wales Branch, B.M.A.: Medical Politics Committee.
MAY 25.—Victorian Branch, B.M.A.: Council.
MAY 26.—New South Wales Branch, B.M.A.: Branch.
MAY 26.—South Australian Branch, B.M.A.: Branch.
MAY 27.—Queensland Branch, B.M.A.: Council.
JUNE 1.—Victorian Branch, B.M.A.: Branch.
JUNE 1.—Western Australian Branch, B.M.A.: Council.
JUNE 2.—South Australian Branch, B.M.A.: Council.
JUNE 3.—Queensland Branch, B.M.A.: Branch.
JUNE 7.—New South Wales Branch, B.M.A.: Organization and Science Committee.
JUNE 10.—Queensland Branch, B.M.A.: Council.
JUNE 14.—New South Wales Branch, B.M.A.: Executive and Finance Committee.

Medical Appointments.

Dr. W. T. Coyle has been appointed Government Medical Officer at Cobargo, New South Wales.

* * *

Dr. M. H. Harris has been appointed Government Medical Officer at Braidwood, New South Wales.

* * *

Dr. A. Wheatley has been appointed Government Medical Officer at Warialda, New South Wales.

* * *

Dr. M. A. Ginsburg-Lapin has been appointed Government Medical Officer at Branxton, New South Wales.

* * *

Dr. J. C. Stewart has been appointed, pursuant to the provisions of the *Workers' Compensation Acts*, a Certifying Medical Practitioner at Melbourne, Victoria.

* * *

Dr. E. McLaughlin has been appointed Honorary Consulting Clinical Pathologist to the Institute of Medical Science of South Australia.

* * *

Dr. M. T. Cockburn has been appointed a member of the Advisory Committee of the Mareeba Babies' Hospital, South Australia.

* * *

Dr. M. A. Mayrhofer has been appointed Medical Officer of Health to the Three Springs Road Board, in accordance with the provisions of *The Health Act*, 1911-1937, of Western Australia.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser", pages xviii-xx.

BRITISH EMPIRE CANCER CAMPAIGN: Medical Secretary and Registrar.
ESPERANCE ROAD BOARD, WESTERN AUSTRALIA: Medical Practitioner.
FREMANTLE HOSPITAL, FREMANTLE, WESTERN AUSTRALIA: Medical Superintendent.
PUBLIC SERVICE COMMISSIONER, ADELAIDE, SOUTH AUSTRALIA: Senior Laboratory Assistant.
ROYAL AUSTRALIAN NAVY: Medical Officers.
STATE PUBLIC SERVICE, QUEENSLAND: Chairman of the Medical Board.
THE LORD HOWE ISLAND BOARD OF CONTROL: Medical Officer.
VICTORIAN EYE AND EAR HOSPITAL, MELBOURNE, VICTORIA: Resident Surgeons.
WOMEN'S HOSPITAL, MELBOURNE, VICTORIA: Pathologist.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17.	Brisbane Associate Friendly Societies' Medical Institute. Proserpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 178, North Terrace, Adelaide.	All Lodge appointments in South Australia. All contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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